STORAGETEK™

Automated Cartridge System Library Software

Installation, Configuration, and Administration Guide

Version 6.1.1

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About this Book

Automated Cartridge System Library Software (ACSLS) is StorageTek's UNIX server software that controls a StorageTek Automated Cartridge System (ACS). The StorageTek ACS family of products consists of fully automated, tape cartridge-based data storage and retrieval systems. ACSLS supports network access to different client systems that can range from workstations to mainframes to supercomputers running on a variety of operating systems.

Audience

This book is for the ACSLS system administrator, who uses ACSLS 6.1 to manage a StorageTek ACS. As ACSLS system administrator, you should already know the following:

- UNIX file and directory structure

- How to use UNIX commands and utilities for your platform

- UNIX system files

- How to do typical UNIX system administrator tasks, such as logging on as `root` and setting up user accesses to a UNIX application

Reader's Comments

We'd like to know what you think about this book. If you'd like, you can e-mail your comments to Software Information Development directly. Our Internet address is:

`sid@stortek.com`

Be sure to include the document title and number with your
comments.

About the Software

This book supports ACSLS 6.1.1.

Note: The StorageTek Customer Resource Center (CRC) on the
World Wide Web lets you download ACSLS PTFs and software
support for product enhancements such as new drive or library
types.

⇨ **To access ACSLS PTFs and software support for
product enhancements:**

1. Using an Internet browser such as Netscape, go to the
   StorageTek CRC. The URL is:

   `http://www.support.storagetek.com/`

2. Select the `Request a Login and Password` link.

3. Fill in the information requested in the form.

   You should receive your account ID and password within
   two days.

4. When you receive your account information, go back to
   the CRC and select the `login` link.

   When prompted, fill in your User ID and password.

5. After you are logged in, select
   Current Products
   Select a Product Family: Software
   Select ACSLS
   (You may want to "View All" to see all the maintenance or
   documentation.)

Conventions for Reader Usability

Conventions are used to shorten and clarify explanations and
examples within this book.

Typographic   The following typographical conventions are used in this book:

- **Bold** is used to introduce new or unfamiliar terminology, or it's used in steps to indicate either an action or a decision the user has to make.

- `Letter Gothic` is used to indicate command names, filenames, and literal output by the computer.

- **`Letter Gothic Bold`** is used to indicate literal input to the computer.

- *`Letter Gothic Italic`* is used to indicate that you must substitute the actual value for a command parameter. In the following example, you would substitute your name for the "username" parameter.

  `Logon` *`username`*

- A bar (|) is used to separate alternative parameter values. In the example shown below either username or systemname must be entered.

  `Logon` *`username | systemname`*

- Brackets [ ] are used to indicate that a command parameter is optional.

- Ellipses (...) are used to indicate that a command may be repeated multiple times.

- This guide shows all ACSLS commands in lowercase. You can, however, enter these commands in all lowercase, all uppercase, or any combination of uppercase and lowercase. Single underlines show minimum command abbreviations. For example, `aud` and `au` are valid forms of the <u>au</u>`dit` command.

Keys   Single keystrokes are represented by double brackets ⟦ ⟧ surrounding the key name. For example, press ⟦ESC⟧ indicates that you should press only the escape key.

Combined keystrokes use double brackets and the plus sign (+). The double brackets surround the key name and the plus sign is used to add the second keystroke. For example, press ⟦ALT⟧+C indicates that you should press the alternate key and the C key simultaneously.

Enter Command

The instruction to "press the ⟦ENTER⟧ key" is omitted from most examples, definitions, and explanations in this book.

For example, if the instructions asked you to "enter" **Logon pat**, you would type in **Logon pat** *and* press ⟦ENTER⟧.

However, if the instructions asked you to "type" **Logon pat**, you would type in **Logon pat** and you would *not* press ⟦ENTER⟧.

Symbols

The following symbols are used to highlight text in this book.

Warning: Information necessary to keep you from damaging your hardware or software.

Caution: Information necessary to keep you from corrupting your data.

Hint: Information that can be used to shorten or simplify your task or they may simply be used as a reminder.

Note: Information that may be of special interest to you. Notes are also used to point out exceptions to rules or procedures.

Technical Support

Refer to the *Requesting Help from Software Support* for information about contacting StorageTek for technical support and for requesting changes to software products. This manual is included the the ACSLS program packing in hard copy only.

Related Documentation

ACSLS 6.1.1 Documentation

The following publications provide more information about ACSLS 6.1.1:

- The *ACSLS 6.1.1 Information CD–ROM*, part number 313495503, which is automatically shipped with the 6.1.1 program package and provides PDF format of all the ACSLS 6.1.1 publications.

- *ACSLS 6.1.1 Product Information* is provided in PDF format and hardcopy. It also is located on the StorageTek Customer Resource Center (CRC). See "ACSLS Information on the StorageTek CRC" on page xxiv for more information.

- *ACSLS 6.1.1 Quick Reference,* part number 313496002, which is automatically shipped with the 6.1.1 program package.

- *ACSLS Messages* is provided in PDF format on the ACSLS 6.1.1 Information CD–ROM and on the CRC. It is also shipped in hardcopy, part number 313495902.

ACSLS Information on the StorageTek CRC

In addition to the PDF collections on the *ACSLS 6.1 Information CD–ROM*, the StorageTek CRC provides PDF collections for ACSLS 6.1. Use the following procedure to access this collection on the StorageTek CRC.

➡ **To access ACSLS PDF collections on the StorageTek CRC:**

1. Using an Internet browser such as Netscape, go to the StorageTek CRC. The URL is:

   `http://www.support.storagetek.com/`

2. Select the `Request a Login and Password` link.

3. Fill in the information requested in the form.

   You should receive your account ID and password within two days.

4. When you receive your account information, go back to the CRC and select the `Login` link.

   When prompted, fill in your User ID and password.

5. After you are logged in, select
   Current Products
   Select a Product Family: Software
   Select ACSLS
   (You may want to "View All" to see all the maintenance or documentation.)

ACS Tape Hardware Info on the StorageTek CRC

The StorageTek CRC provides PDF file format of many of StorageTek's ACS tape hardware publications. Use the following procedure to access these publications on the StorageTek CRC.

➥ **To access StorageTek ACS tape hardware documentation on the StorageTek CRC:**

1. Using an Internet browser such as Netscape, go to the StorageTek CRC. The URL is:

   `http://www.support.storagetek.com/`

2. Select the `Request a Login and Password` link.

3. Fill in the information requested in the form.

   You should receive your account ID and password within two days.

4. When you receive your account information, go back to the CRC and select the login link.

   When prompted, fill in your User ID and password.

5. After you are logged in, select
   Current Products
   Select a Product Family: Tape
   Select the Tape and Library product documentation you want.

Chapter 1. Overview

What is ACSLS?

Automated Cartridge System Library Software (ACSLS) is StorageTek's server software that controls a StorageTek Automated Cartridge System (ACS). ACSLS accesses and manages information stored in an ACS through command processing across a network. The software includes a system administration component, interfaces to client system applications, and library management facilities.

Figure 1 shows how ACSLS connects the client system with the library. The client system consists of a Client System Component (CSC), an interface between client applications and ACSLS that is written using the CSC developer's toolkit. Independent software vendors commonly write CSCs for their applications.
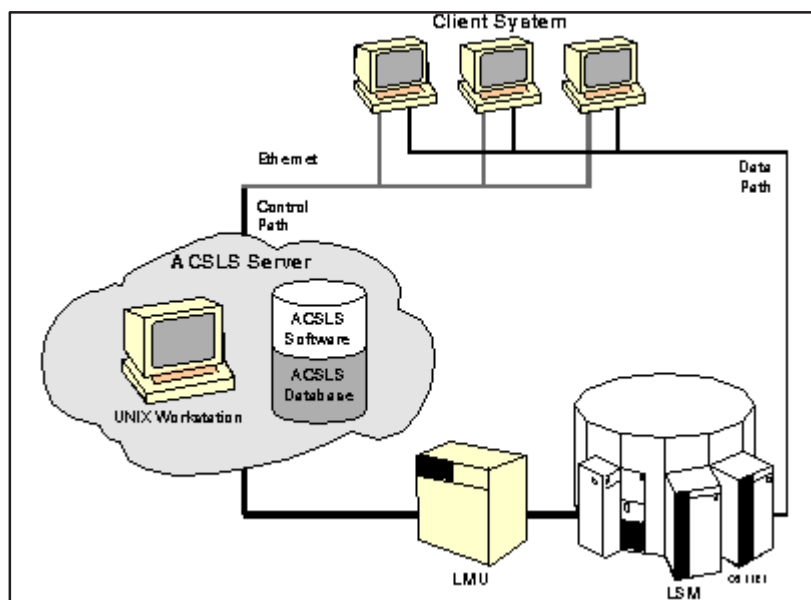
Figure 1.   Library with ACSLS Server

The acssa and acsss User IDs

To control and interact with ACSLS, you use the following user IDs:

acssa

lets you enter ACSLS commands from cmd_proc.

acsss

lets you run ACSLS utilities from the UNIX command line prompt. You can also open a cmd_proc from the acsss user ID if you prefer to work from a single user ID; see "Manually Starting a cmd_proc" on page 16 for more information.

You can log into multiple windows with both the acssa and the acsss user IDs. This lets you enter both ACSLS utilities and commands as shown in Figure 2.
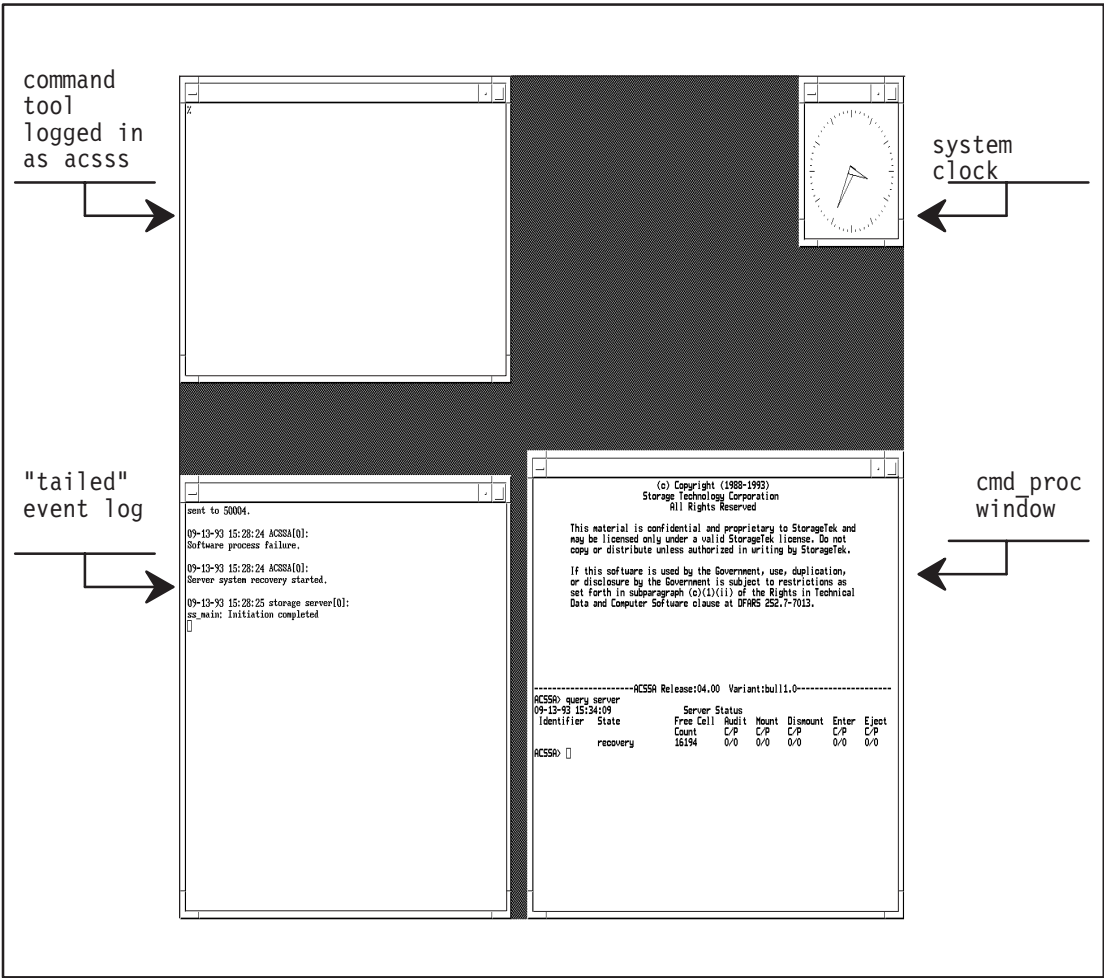
Figure 2.   Example Screen Display with multiple windows

The screen display shown in Figure 2 contains the following windows:

A UNIX command tool
> logged in as the `acsss` user.

A "tailed" ACSLS Event Log
> that lets you monitor ACSLS activity; see "Event Log" on page 579 for more information.

A `cmd_proc` window
> that lets you enter ACSLS commands.

A system clock
> showing the current date and time.

Starting ACSLS

You can start ACSLS in either of the following ways:

- Automatically at workstation boot (if the ACSLS server system startup file references the `rc.acsss` utility).

  Hint: The startup file /etc/rc on the ACSLS server contains comments that describe how to modify this file to enable automatic startup.

- Manually by running the `rc.acsss` utility.

When you start ACSLS, the server is in recovery mode. This happens because during its initialization the database and recovery status of the library volumes and library hardware is checked.

⇨ **To manually start ACSLS, do the following:**

1. Open a UNIX command tool.

2. If you are on a remote system, to access the ACSLS server, enter the following command:

   telnet *hostname*

   Where *hostname* is the UNIX hostname of the ACSLS server. Otherwise, go to Step 3.

3. Log in as `acsss`.

4. Enter the following command:

   rc.acsss

   Hint: You usually start ACSLS in the run state. To start ACSLS in the idle state, enter the following command:

   rc.acsss idle

Stopping ACSLS

Use this procedure to shut down ACSLS and the database. Typically, you would use this procedure before:

- Performing maintenance on the ACSLS server.

- Backing up the entire ACSLS server disk.

    Hint: Backing up the entire ACSLS server disk is not the same as backing up the ACSLS database using the `bdb.acsss` utility. See "Chapter 11, Database Backup and Restore" for procedures for backing up and restoring the database.

Caution: Do not use the following procedure before upgrading to a new release of ACSLS! See Chapter 3, "Installing ACSLS on Solaris 8", Chapter 4, "Installing ACSLS on Solaris 9", or Chapter 5, "Installing ACSLS on AIX " for specific procedures for doing an upgrade installation.

➭ **To stop ACSLS, do the following:**

1. If you are not already logged in as `acsss` do so now.

2. Bring up a `cmd_proc`.

    You can do this either on the `acsss` user ID or you can log in to `acssa`.

3. From the `cmd_proc`, enter the following commands to idle the server and log off from the `cmd_proc`:

    idle
    logoff

4. On the `acsss` user ID, bring up a UNIX command tool, enter the following command to stop ACSLS:

   `kill.acsss`

   If `kill.acsss` cannot find a process ID file, the following message appears:

   `kill.acsss: PID file (/tmp/acsss.pid) does not exist, library server not terminated.`

   If this message appears, do the procedure in "Manually Killing the ACSLS Process" on page 12, then continue with Step 5.

5. From the UNIX command tool, enter the following command to shut down the database:

   `db_command stop`

   Wait until you receive the database shutdown message.

Using a cmd_proc

cmd_proc Window   Figure 3 shows the `cmd_proc` window displayed when you log
in as `acssa`. The `cmd_proc` window is a split screen where the
top section is the message area and the bottom section is the
command area. You enter ACSLS commands at the prompt.

ACSLS must be running to accept commands. If you see the
message `Query: Query failed. Process failure`, wait up
to a minute and re–issue the `query server` command.

```
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                           All Rights Reserved

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   set forth in subparagraph (c)(1)(ii) of the Rights in Technical
   Data and Computer Software clause at DFARS 252.7-7013.


   ----------------------------- ACSLS 6.1  ---------------------------
   ACSSS> query server
   2001-01-23 15:41:42
                              Server Status
   Identifier  State  Free Cell  Audit  Mount  Dismount  Enter  Eject
                      Count      C/P    C/P    C/P       C/P    C/P

               run    267        0/1    0/0    0/0       0/0    0/0

   ACSSS>
```

Figure 3.   cmd_proc Window

How to Suspend and Resume a cmd_proc

If you use the "Manually Starting a cmd_proc" procedure on page 16, you can suspend the cmd_proc to perform UNIX commands, and then resume the cmd_proc.

Hint: Note the following:

1. You must start the cmd_proc manually.

2. You must use the C, K, or Bourne shell for this procedure.

3. Any in-process requests that you initiated at the cmd_proc will continue to completion while the cmd_proc is suspended.

➪   **To suspend and resume a** cmd_proc**, do the following:**

1. While running a cmd_proc, press ⟦CTRL⟧ + Z.

2. The UNIX shell prompt appears.

   Perform whatever UNIX operations you want.

3. To resume the cmd_proc, enter the following UNIX command:

   fg

How to Exit a cmd_proc

Use this procedure to terminate an interactive `cmd_proc` session.

➡️ **To terminate an interactive** `cmd_proc` **session, do the following:**

1. While running a `cmd_proc`, wait until all in-process activity is complete and the ACSSS> prompt has returned.

2. To exit the `cmd_proc`, enter the following command:

   `logoff`

   The `cmd_proc` terminates.

Manually Killing the ACSLS Process

If kill.acsss cannot find a process ID file, you must manually kill the ACSLS process.

➪ **To manually kill the ACSLS process, do the following:**

1. From cmd_proc, enter the following command:

   query server

2. If ACSLS is running, to display the ID of its process daemon, from the acsss shell prompt, enter the following command:

   ps -ef | grep acsss_daemon

   The left column of the display shows the process ID for the ACSLS process (**acsss_daemon).**

3. From the acsss shell prompt, enter the following command:

   kill -term *pid*

   where *pid* is the **acsss_daemon** process ID.

Starting a cmd_proc

You can start a cmd_proc from any terminal type with a minimum 24 x 80 display size. The terminal type must be defined in the workstation's /etc/termcap file.

After logging in, you can start additional cmd_procs by entering the cmd_proc command from a UNIX command tool as described in "Manually Starting a cmd_proc" on page 16. Typically, you will run only one cmd_proc, but you can run as many as your system resources will allow.

Hint: If you start a cmd_proc without specifying the −q option and ACSLS is not running, the cmd_proc window hangs. If this happens, quit the window and start another cmd_proc.

Logging in as acsss from the ACSLS Server

☞   **To start a** cmd_proc **when logged in as** acsss **on the ACSLS server, do the following:**

1. From the ACSLS server, open a UNIX command tool.

2. To log in as acsss enter the following command:

    login acsss

3. To start the cmd_proc, enter the following command:

    cmd_proc

4. Respond to the prompt by entering your terminal type.

    Example of terminal types are sun, sun−cmd, xterm, and dtterm.

5. Press ⟦RETURN⟧.

    The cmd_proc window appears.

**Logging in
Remotely as acssa**

➪   **To start a** cmd_proc **by logging in remotely as** acssa**, do
        the following:**

1. From a UNIX host on the network, open a UNIX
    command tool.

2. To access the ACSLS server, enter the following
    command:

    rlogin *hostname* **-l acssa**

    Where *hostname* is the UNIX hostname of the ACSLS
    server.

3. Respond to the prompt by entering your terminal type.

    Example of terminal types are sun, sun-cmd, xterm, and
    dtterm.

4. Press ⟦RETURN⟧.

    The cmd_proc window appears.

Logging in as acssa from a Non-UNIX Client

Use this procedure to start an interactive command cmd_proc from a non-UNIX client on the network.

Hint: To use this procedure you must have a TCP/IP link to the ACSLS server. Depending on your installation, you may be directly connected to TCP/IP, or you may have to access it manually.

🖙   **To start a** cmd_proc **from a non-UNIX client:**

1. If necessary, access TCP/IP.

    See your system administrator for instructions on how to access TCP/IP at your location.

2. To access the ACSLS server, enter the following command:

    telnet *hostname*

    Where *hostname* is the UNIX hostname of the ACSLS server.

3. Log in as acssa.

4. Respond to the prompt by entering your terminal type.

    Example of terminal types are sun, sun-cmd, xterm, and dtterm.

5. Press ⟦RETURN⟧.

    The cmd_proc window appears.

Manually Starting
a cmd_proc

Typically, you will manually start a cmd_proc from the acsss user ID if you do not want to log in as acssa to bring up a cmd_proc.

➪ **To manually start a** cmd_proc**, do the following:**

1. While logged in as acssa or acsss, open a UNIX command tool.

2. To start the cmd_proc, enter the following command:

   cmd_proc

3. Respond to the prompt by entering your terminal type.

   Example of terminal types are sun, sun-cmd, xterm, and dtterm.

4. Press ⟦RETURN⟧.

   The cmd_proc window appears.

cmd_proc options

When you manually start a cmd_proc, you can also enter the following options:

-q

suppresses the automatic query server command.

-l

brings up cmd_proc in command line mode (command area only, no split screen, no message area).

cmd_proc Keyboard Shortcuts   Table 1. describes the cmd_proc keyboard shortcuts, which are 〚CTRL〛 + keystroke combinations.

Table 1.   cmd_proc Keyboard Shortcuts

Key Combination	Action	Notes
〚CTRL〛 + C	Cancels the last cmd_proc command.	〚CTRL〛 + C is the keyboard shortcut for the <u>cance</u>l command. See "cancel" on page 375 for more information about the <u>cance</u>l command.
〚CTRL〛 + D	Returns to the cmd_proc prompt.	〚CTRL〛 + D has no effect if the current command has completed. If the current command is processing, it completes but cmd_proc does not display a response message. If you have not entered the current command at the ACSSS prompt, 〚CTRL〛 + D deletes the command.
〚CTRL〛 + H	Deletes the previous character on the command line.	On most keyboards, you can also use the 〚DELETE〛or 〚BACK SPACE〛 key.
〚CTRL〛 + I	Refreshes the cmd_proc display	This function is useful if the current cmd_proc display has been corrupted by noise on the communications lines.
〚CTRL〛 + R	Refreshes the current command line.	This function is useful if the current command line display has been corrupted by noise on the communications lines.
〚CTRL〛 + U	Deletes the current command line.	
〚CTRL〛 + Z	Suspends cmd_proc and escapes to the shell environment.	Enter the C shell fg command to resume cmd_proc.

**Redirecting
cmd_proc Inputs
and Outputs**

You can use an input file to automatically enter commands when you start a `cmd_proc`. For example, the following input file verifies ACSLS by mounting and dismounting a volume.

```
query drive 0,0,10,0
query volume JB1400
mount JB1400 0,0,10,0
dismount JB1400 0,0,10,0 force
logoff
```

➪ **To start an additional** `cmd_proc` **and specify an input file, do the following:**

5. To start the `cmd_proc`, enter the following command:

   cmd_proc −q < *filename*

You can also start a `cmd_proc`, specify an input file, and redirect the output to another file. Using input and output files lets you run a set of commands at `cmd_proc` startup and look at the results. For example, the following file shows the results of the commands run in the previous example that showed `cmd_proc` with only an input file.

```
ACSSA> query drive 0,0,10,0
1998-06-30 18:23:08
Identifier     State          Status          Volume
0,0,10,0       online         available
ACSSA> query volume JB1400
1998-06-30 18:23:09
Identifier     Status         Current Location
JB1400         home           0,0,3,0,0
ACSSA> mount JB1400 0,0,10,0
ACSSA> Mount: JB1400 mounted on  0,0,10,0
ACSSA> dismount JB1400 0,0,10,0 force
ACSSA> Dismount: Forced dismount of JB1400 from  0,0,10,0
ACSSA> logoff
ACSSA>
```

☞   **To start an additional** cmd_proc**, specify an input file,
      and redirect the output, do the following:**

1. While logged in as acssa or acsss, open a UNIX
    command tool.

2. To start the cmd_proc, enter the following command:

    cmd_proc −q < *file1* **>** *file2*

    Where *file1* is the input file and *file2* is the file to which
    the output is directed.

    By default, cmd_proc display area messages are written to
    stderr. but you can also redirect these messages. For
    example:

    cmd_proc −q < *file1* **>** *file2* **2>&1**

Idling ACSLS   Use this procedure to suspend request processing by putting
ACSLS in the idle state. Typically, this procedure is used before
shutting down ACSLS, but you can also use it to temporarily
stop ACSLS request processing.

⇨   **To idle ACSLS, do the following:**

1.   From a cmd_proc, enter the following command:

     idle

     ACSLS processes all current requests, rejects all new
     requests, and goes into the idle state.

Restarting ACSLS   Use this procedure to resume request processing by putting
ACSLS in the run state. Typically, you restart ACSLS to
remove it from the idle state.

⇨   **To restart ACSLS, do the following:**

1.   From a cmd_proc, enter the following command:

     start

     ACSLS resumes request processing.

ACSLS Directory Structure

Table 2. shows a listing of the directories, subdirectories, and most common used files and shell scripts in ACSLS directory structure.

Two variables are used for ACSLS paths. They are:

- $ACS_HOME

  This is the home directory for the `acsss` user ID. It is also where the ACSLS product is installed.

  ○ For Solaris, $ACS_HOME is /export/home/ACSSS by default. However, the parent directory of $ACS_HOME is the ACSLS installation directory (by default /export/home), which is customer–defined during ACSLS installation on Solaris.

  ○ For AIX, $ACS_HOME must be /export/home/ACSSS because of Package Manager constraints.

- $INFORMIX_BACKUP_DIRECTORY

  This is the directory where the ACSLS backups are saved. When second disk support is installed, the $INFORMIX_BACKUP_DIRECTORY is moved to the second disk. When second disk support is uninstalled it returns to the primary disk.

Table 2.   ACSLS Directory Structure

Directory	Contents
`/export/backup/` (referred to as `$INFORMIX_BACKUP_DIRECTORY`)	Database backups (for single disk systems).
`/etc/`	Miscellaneous UNIX files.
`/etc/hosts`	List of machines on the network and their addresses.

Table 2.   ACSLS Directory Structure

Directory	Contents
/etc/passwd	Basic information for each authorized user on the network.
/etc/networks	Information describing the TCP/IP network.
/etc/netmasks	Network masks used to implement IP standard subnetting.
/etc/rc	Command script; includes instructions to start up ACSLS automatically on system reboot.
$ACS_HOME (by default/export/home/ ACSSS/)	Home directory for the acsss user ID. Also the ACSLS home directory. (By default, the ACS_HOME environment variable points to this directory.)
$ACS_HOME/.acsss_env	Defines the ACSLS environment variables.
$ACS_HOME/.login	Defines the ACSLS working environment; used by the C shell.
$ACS_HOME/.profile	Defines the ACSLS working environment; used by the k or Bourne shell.
$ACS_HOME/kill.acsss	ACSLS shutdown script.
$ACS_HOME/rc.acsss	ACSLS startup script.
$ACS_HOME/bin/ (by default/export/home/ACSSS/ bin/)	Contains executable shell scripts and programs.
$ACS_HOME/bin/ acsss_config	ACSLS configuration program.
$ACS_HOME/bin/backup.sh	Automatic database backup script.
$ACS_HOME/bin/bdb.acsss	Manual database backup script.

Table 2.   ACSLS Directory Structure

Directory	Contents
$ACS_HOME/bin/db_command	Database startup/shutdown script.
$ACS_HOME/bin/ db_export.sh	Database export script.
$ACS_HOME/bin/ db_import.sh	Database import script.
$ACS_HOME/bin/rdb.acsss	Database recovery script.
$ACS_HOME/bin/volrpt.exe	Executable to run volume report script.
$ACS_HOME/config/ (by default /export/home/ACSSS/config/)	Contains ACSLS configuration files.
$ACS_HOME/data/external/ (by default /export/home/ACSSS/data/ external)	Contains customized files used in access control, mixed media, and volume reporting.
$ACS_HOME/data/external/ access_control/	Contains access control sample and customized files.
$ACS_HOME/data/external/ access_control/adi.names	Lists ADI names and user IDs of all hosts (OSLAN protocol).
$ACS_HOME/data/external/ access_control/adi.na- mes.SAMPLE	Sample adi.names file; <u>not</u> actually used for controlling access.
$ACS_HOME/data/external/ access_control/com- mand.ALL.allow	Lists users allowed to use all commands.
$ACS_HOME/data/external/ access_control/com- mand.*command*.allow	Lists users allowed to use this command.
$ACS_HOME/data/external/ access_control/ command.*command*.disallow	Lists users not allowed to use this command.
$ACS_HOME/data/external/ access_control/ command.SAMPLE.allow	Sample command allow file; <u>not</u> actually used for controlling access.

Table 2.   ACSLS Directory Structure

Directory	Contents
`$ACS_HOME/data/external/ access_control/ command.SAMPLE.disallow`	Sample command disallow file; <u>not</u> actually used for controlling access.
`$ACS_HOME/data/external/ access_control/ internet.addresses`	Lists Internet addresses and user IDs of all hosts (TCP/IP protocol).
`$ACS_HOME/data/external/ access_control/ internet.addresses.SAMPLE`	Sample internet.addresses file; <u>not</u> actually used for controlling access.
`$ACS_HOME/data/external/ access_control/ ownership.assignments`	Information about assigning ownership to volumes.
`$ACS_HOME/data/external/ access_control/ users.ALL.allow`	Lists users allowed to access owned volumes with all commands.
`$ACS_HOME/data/external/ access_control/ users.ALL.disallow`	Lists users not allowed to access owned volumes with any command.
`$ACS_HOME/data/external/ access_control/ users.command.allow`	Lists users allowed to access owned volumes with this command.
`$ACS_HOME/data/external/ access_control/ users.command.disallow`	Lists users not allowed to access owned volumes with this command.
`$ACS_HOME/data/external/ access_control/ users.SAMPLE.allow`	Sample volume allow file; <u>not</u> actually used for controlling access.
`$ACS_HOME/data/external/ access_control/ users.SAMPLE.disallow`	Sample volume disallow file; <u>not</u> actually used for controlling access.
`$ACS_HOME/data/external/ fixed_volume`	Contains Extended Store Feature sample and customized files.
`$ACS_HOME/data/external/ fixed_volume lsm_fixed_volume`	Extended Store Feature Control file; must be modified to enable this feature.

Table 2. ACSLS Directory Structure

Directory	Contents
$ACS_HOME/data/external/ mixed_media/	Contains mixed–media sample and customized files.
$ACS_HOME/data/external/ mixed_media/ scratch_preferences.dat	Lists transport types and a (user-defined) prioritized list of media types to use when selecting scratch volumes.
$ACS_HOME/data/external/ mixed_media/ scratch_pre- ferences.SAMPLE	Sample scratch preferences file; not actually used for controlling media.
$ACS_HOME/data/external/ volrpt/	Contains volume report sample and customized scripts.
$ACS_HOME/data/external/ volrpt/ owner_id.volrpt	Sample custom volume report input file.
$ACS_HOME/data/internal/ (by default /export/home/ACSSS/ data/internal/)	ACSLS internal files. Please do not modify.
$ACS_HOME/data/internal/ mixed_media/	Contains ACSLS internal mixed media files. Do not modify these files.
$ACS_HOME/data/internal/ mixed_media/ drive_types.dat	Lists supported transport types.
$ACS_HOME/data/internal/ mixed_media/ media_cleaning.dat	Lists transport types and compatible cleaning cartridge types.
$ACS_HOME/data/internal/ mixed_media/ media_compatibility.dat	Lists transport types and compatible media types.
$ACS_HOME/data/internal/ mixed_media/ media_types.dat	Lists supported media types.
$ACS_HOME/diag/	Contains diagnostic files and shell scripts.

Table 2.   ACSLS Directory Structure

Directory	Contents
$ACS_HOME/diag/bin/ pinglmu.sh	Post-configuration tool to check connections between ACSLS server and serial–attached libraries.
$ACS_HOME/diag/bin/ probe-scsi.sh	Post-configuration tool to check connections between ACSLS server and SCSI libraries.
$ACS_HOME/diag/bin/ README.txt	Describes the utilities in /export/home/ACSSS/diag/ bin.
$ACS_HOME/diag/data/ ivp.dat	Data file used to drive the IVP mount/dismount activities.
$ACS_HOME/diag/ivp/ivp.sh	Initial Verification Program (IVP) used for testing the mount/dismount commands.
$ACS_HOME/diag/ ivp/README.ivp	Explanation of the IVP process.
$ACS_HOME/install/	Contains ACSLS installation scripts.
$ACS_HOME/install/ full_disk.sh	Database automatic checkpoint backup script.
$ACS_HOMEinstall/ sd_mgr.sh	Second disk installation script.
$ACS_HOME/lib/ (by default /export/home/ACSSS/ lib/)	Contains ACSLS installed shared libraries required at runtime.
$ACS_HOME/log/ (by default /export/home/ ACSSS/log/)	Contains ACSLS event log and utility event log files.
$ACS_HOME/log/ acsss_config.log	Report of the library hardware configured by the acsss_config program.
$ACS_HOME/log/ acsss_config_event.log	Logs events for the acsss_config program.

Table 2.   ACSLS Directory Structure

Directory	Contents
$ACS_HOME/log/ acsss_event.log	ACSLS event log.
$ACS_HOME/log/ bdb_event.log	Logs events for the bdb_acsss script.
$ACS_HOME/log/ cron_event.log	Logs events for the cron job that calls the full_disk.sh script.
$ACS_HOME/log/ export_event.log	Logs events for the db_export.sh script.
$ACS_HOME/log/ full_disk.sh.log	Logs events for the full_disk.sh script.
$ACS_HOME/log/ import_event.log	Logs events for the db_import.sh script.
$ACS_HOME/log/install.log	Logs events for the install.sh script.
$ACS_HOME/log/ rdb_event.log	Logs events for the rdb.acsss script.
$ACS_HOME/log/scsilh.log	Logs events for SCSI LSM activity while in diagnostic mode.
$ACS_HOME/log/ sd_event.log	Logs events for the sd_mgr.sh script.
$ACS_HOME/log/volrpt.log	Logs events for the volume report script.
$BASEDIR/ACSSA/ (by default /export/home/ ACSSA/)	acssa home directory.
$BASEDIR/informix/ (by default /export/home/ informix/)	Database home directory.
/second_disk/	Second disk files
/second_disk/backup/ (referred to as $INFORMIX_BACKUP_DIRECTORY)	Database backups when second disk support is installed.

Table 2. **ACSLS Directory Structure**

Directory	Contents
`/tmp/`	Temporary files.
`/tmp/ acsss.pid`	ACSLS process ID file; used in ACSLS startup and shutdown.

Chapter 2. ACSLS License Key

ACSLS License Key Utility

The licensekey.sh utility activates the license key that allows you to use ACSLS. To run the licensekey utility script, enter:

licensekey.sh

Warning: You must activate a license key to use ACSLS. Activation of a license key requires that you input your license key during ACSLS installation. To avoid unnecessary delays obtain your license key before you begin the ACSLS installation.

The three types of license keys are:

- Temporary: For short–term use in emergency situations. Limited to a number of days.

- Evaluation: For short–term use for evaluation or demonstration of the software.

- Periodic: To enable customer to use ACSLS when StorageTek has received the initial license fee for a product or feature.

Note: Customers may evaluate additional features for a product for which they hold a periodic key by requesting a new evaluation key that will overlay the customer's current periodic key. When the evaluation license expires, the customer has the option of either requesting a new permanent periodic key

including authorization to run the newly licensed feature or reverting to the former periodic key to continue without the feature. In either case, the customer will need to input either the replacement periodic key or the former periodic key.

To obtain your license key,

Software license key requests must be submitted online through the StorageTek Customer Resource Center (CRC) at the following url: http://www.support.storagetek.com/

Click on Tools & Services and and then on Software Keys. Then select the ACSLS 6.1 Key Request. All fields in red type are required and must be completed before submitting the license key request.

Be prepared to furnish the following information:

1. Your Company Name as it appears on your StorageTek Software License Agreement.

2. The name, telephone number, and e–mail address of the person within your company who is to receive the key.

3. Your StorageTek Site Location Number.

4. The StorageTek SAP System Order Number. (This number appears on the packing list shipped with the ACSLS Software.)

5. The Product and Release number of the product for which you require a key (ex. ACSLS 6.1).

6. The features to be included in your order, e.g., number of slots, Library Management Gateway.

Keys will be issued within 48 hours of the license key request, Monday through Friday, 7:00 a.m. to 4:00 p.m. Mountain Time, except holidays.

If an emergency temporary key is required outside of the business hours listed above, request a temporary license key online at the StorageTek Customer Resource Center (CRC) http://www.support.storagetek.com. Click on Tools & Services and then on Emergency Software Key. Fill in the information

required. The key will be generated and emailed to the address supplied. The emergency key will expire after seven (7) days. You will be contacted on the next business day for a long–term solution.

Format

```
licensekey.sh CUSTOMER_NAME 097531 2003057 ACSLS610 FWZZCH*DYZUP383Q
```

Licensekey parameters must be entered **exactly** as received from StorageTek.

An ACSLS license key consists of the following fields:

1. The customer name (64–character maximum, valid characters include A–Z, 1–9, *, and blank). All letters must be upper case.

    CUSTOMER_NAME is the customer name.

2. The site number, consisting of from four to six numeric characters.

    nnnnnn is the site number.

3. The expiration date, expressed in seven numeric characters (in ISO standard date format).

    yyyyddd is the license key expiration date.

    Hint: The license key expiration date is expressed:

    ○ *yyyy*=year expressed in four numerals, e. g., 2003.

    ○   *ddd*=the number of days into the year counting from January 1 (the Julian day of the year), e. g., 229 is the two–hundred twenty–ninth day of the year.

4. A product identification number, consisting of eight alphanumeric characters

    product_identifier is composed of the product name (ACSLS) followed by the three (3) character release id (i.e. 610, 611, 620, etc).

Chapter 2. ACSLS License Key   **31**

5. An encoded license key between 14 and 17 characters long.

license_key_string is the encrypted license key option string.

Licensekey Validation

ACSLS validates the license key upon entry, during product initialization, and at a preset time each day. The product will not initialize at system startup if the customer does not have the appropriate product/feature license key. While the ACSLS system is up and running, warning messages are issued if the customer exceeds his licensed library capacity.

License Key Operational Procedures

License keys are entered, updated, or replaced by invoking the licensekey script from the command line.

1. To initialize ACSLS with a valid license key during product installation,

   ○ After configuring the database with `acsss_config`, but prior to entering `rc.acsss`, run the `licensekey.sh` script.

   ○ Enter the required fields described in the "Licensekey Parameters" section above.

     Hint: Copy and paste from your license key email to avoid typing errors.

   ○ Enter: `rc.acsss`

     ACSLS initializes.

2. To update or replace an ACSLS license key,

   ○ Run `licensekey.sh` with the correct parameters. This can be done online without recycling ACSLS.

   ACSLS should accept the new license key.

3. If you experience errors with your ACSLS license key,

○ Consult the *ACSLS Messages Manual, Version 6.1*, and follow the instructions for the error message you received.

○ If you are still unable to resolve the problem, contact the StorageTek Software Manufacturing and Distribution department (1–800–678–5554) and select option three, or call your StorageTek Marketing Representative or Systems Engineer during normal business hours.

Chapter 3. Installing ACSLS on Solaris 8

ACSLS 6.1.1 supports Solaris 8. StorageTek does not support down level versions of the operating system for this release. This chapter describes procedures for installing ACSLS on Solaris 8.

To apply any maintenance, refer to the installation instructions in the associated PUT or SPE or PTF document included with the CD–ROM, or the document associated with the maintenance tar file on the StorageTek Customer Resource Center (CRC) web page.

This chapter takes you through and discusses the following steps for installing ACSLS on Solaris 8. In these steps:

1. Have your license key information and ACSLS 6.1.1 CD–ROM available.

2. Backup and export the database if you are upgrading from a previous version of ACSLS (see *Exporting the Database* in "Chapter 11: Database Backup and Restore").

3. Prepare for Solaris 8 installation.

4. Install the Solaris 8 operation system.

5. Prepare for ACSLS installation.

6. Install ACSLS.

7. Import the database from any previous version.

8. Run acsss_config to configure your library hardware (see "Chapter 7: Configuring your Library Hardware").

9. Enter your license key information (see "Chapter 2: ACSLS License Key").

10. Reset any custom dynamic or static variables.

11. Audit new libraries.

12. Verify the ACSLS installation.

In addition, this chapter discusses:

- ACSLS Setup for Client Communication

- Regressing to a previous version of ACSLS

- Uninstalling ACSLS 6.1.1

Step 1: Backup and Export the Database

Perform this step if you are upgrading from a previous version of ACSLS (see the section for *Exporting the Database* in "Chapter 11: Database Backup and Restore").

Step 2: Preparing for Solaris Installation

Before installing Solaris, complete the following steps:

1. Have your license key information and ACSLS 6.1.1 CD–ROM available.

2. Satisfy all requirements specified in *Product Information* (see "ACSLS Online Information on the StorageTek CRC") prior to installation of Solaris or ACSLS.

3. Install the library hardware according to the StorageTek installation instructions.

   Note: If you are installing a SCSI library, you should connect the server to the library before installing ACSLS. The install.sh script installs device drivers and kernel patches. If the SCSI cable is not connected, the device driver installation fails. However, if library hardware is not

available at the time of software installation, the driver can be installed separately at a later time.

4. Install the ACSLS server hardware according to the hardware manufacturer's instructions.

5. Determine and record information about network communication settings.

   Caution: Consult your system administrator for assistance in obtaining this information. It is critical that this information is correct in order for ACSLS to run properly.

Table 3.   Pre-Installation Worksheet

Installation Options	Your System Values
❏ Host Name	
❏ Network Adapter	
❏ Internet Protocol Address	
❏ Name Service	
❏ Network Mask	
❏ Domain Name	
❏ Gateway Address	
❏ Name Server	
❏ Subnets	
❏ System Type	

Step 3: Installing the Solaris 8 Operating System

Insert the Solaris CD (`Solaris 8 Software`) into the CD-ROM drive. This is CD–1 (of 2).

STOP   **Do *not* insert the `Solaris 8 Installation` CD.** Doing this installs the incorrect version for using ACSLS.

⇨   **To install the Solaris 8 operating system:**

1. Boot your system from the CD–ROM containing the Solaris operating system:

   a. Press ⟦STOP⟧+A.

   b. Insert the Solaris CD (**Solaris 8 Software – CD 1 of 2**) into the CD-ROM drive.

      Do *not* insert the Solaris 8 Installation CD.

   c. From the ok prompt, enter

      boot cdrom

      Press ⟦ENTER⟧.

   Note: If you have configured the SCSI/Ethernet card on an Ultra 10 and you are not using the second Ethernet connection, then disregard the message, "home1: link down".

   Hint: The Solaris Install Console will appear first. During the installation process, this console provides messages indicating what the system is doing.

2. Select Language.

   In Japanese, the variable ja_jp must be changed to C (English). This displays the instructions in Engish and matches this document.

3. Select Locale options.

   Solaris Installation program Open Windows is started.

4. In the Network Connectivity screen, select yes and then Continue.

5. In the DHCP screen, unless you are using DHCP, select no and Continue.

6. In the Primary Network Interface screen, enter your device name and then select Continue.

7. In the `Host Name` screen, enter the Host Name for your system and press `Continue`.

8. Enter your IP address and press `Continue`.

9. To enable IPv6 select `no`; press `Continue`.

10. Confirm the `Host Name`, `Networked`, and `IP address` in the `Confirm Information` screen, and press `Continue`.

11. Select `no` for `Configure Security Policy` and press `Continue`. Then confirm security information.

12. Select the type of name server used in your system in the `Name Service` screen, and press `Continue`.

    Notes:

    ○ Select `none`

    ○ Do *not* select the `NIS+` or `NIS` or `DNS` services unless your system administrator can configure these services correctly.

    ○ If one of these services is selected, a number of different prompts appear. Respond to these prompts appropriately.

13. Confirm the `Name Service` in the `Confirm Information` screen, and press `Continue`.

14. Select `yes` in `Part of a Subnet` screen.

    Enter your netmask and press `Continue`.

15. Select `Yes` or `No` in the `Subnets` screen.

    If you selected `Yes`, the `Netmask` screen appears. Enter your Netmask and press `Continue`.

16. Specify your time zone type in the `Geographical Regions` screen and click `Set`.

17. Enter the current date and time (if required) in the `Date and Time` screen and press `Continue`.

18. Press `Continue` on the `Confirm Information` screen.

    The `Solaris Interactive Installation` screen displays.

19. The first `Solaris Interactive Installation` screen describes the differences between an initial installation and a Solaris upgrade. Make your selection.

20. The second `Solaris Interactive Installation` screen describes what occurs during an initial install. Press `Continue`.

21. Verify your regions setting in the `Select Geographic Regions` screen and press `Continue`.

22. Verify `End User System Support` and `Solaris 64 Bit Support` is enabled.

23. `Select to Include Solaris 64 Bit Support` to enable 64-bit support. (This applies to SUN Ultra platforms.)

24. Press `Customize....`

    The `Customize Software` screen appears displaying the `Software Clusters and Packages` window.

    Hint: In the `Software Clusters and Packages` window, an item is *selected* when the square preceding it is completely blacked out. Some items may already be selected by the system. Make sure that you do not deselect these items by clicking on items already blacked out.

    Deselected   Partial Selected   Selected
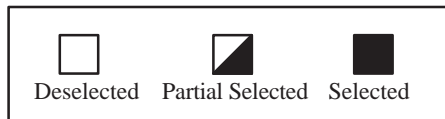
25. Scroll down and locate `On-Line Manual Pages` in the `Software Clusters and Packages` window. Click once to fully select the `Man Pages`.

26. Continue scrolling down and locate `OpenWindows Version 3 (64 bit)` in the `Software Clusters and`

Packages window. Select 64 bit and click twice to fully select that option.

27. Continue to scroll down through the main directory to Programming tools and libraries.

    a. Click on the triangular arrow (Collapsed Cluster) in the left margin of Programming tools and libraries to expand the subdirectory.

    b. Select CCS tools bundled with SunOS.

    c. Click on the triangular arrow (Collapsed Cluster) in the left margin of Programming tools and libraries to close the subdirectory.

28. Press OK to exit the Customize Software screen.

29. Press Continue when the Select Software screen displays.

30. If the boot disk is displayed in the Available Disks window, select it, then press the single-right-arrow button to move it to the "Selected disks" column.

    Repeat this step for the second disk and move it in the second column.

31. Press Continue on the Select Disks screen.

    The Preserve Data? screen displays.

32. Press Continue for a new installation and/or to overwrite current file systems and unnamed file systems. (Press Preserve... to preserve existing data during an upgrade installation.)

33. Press Manual Layout in the Automatically Layout File Systems? screen.

34. Press Customize in the File System and Disk Layout screen to define disk partitions for ACSLS.

    The Customize Disks screen displays.

35. Define the primary disk partitions.

In the following discussion, /export/home is used as the directory where ACSLS is installed; however, in this release ACSLS now installs to any directory in Solaris. You can now install ACSLS in any directory.

Enter the values specified to define primary disk partitions for the database:

○ Assign the mount point for each of the eight partitions in the left column.

○ Assign the size for each slice in the right column except for /export/backup.

Do *not* make root any smaller than 50 MB.

Swap space must be no smaller than 300 MB.

The size of /usr must be at least 700 MB.

/export/home must be at least:

    600 MB for a 2.1 GB disk

    1 GB for a 9 GB or larger disk

For information about determining the size of your primary and secondary disks, see *ACSLS Product Information*, "Determining Disk Size Requirements".

○ Assign /export/backup *last.* Assign /export/backup the amount displayed in Free: after entering all other values. You should have no less than:

    400 MB for a 2.1 GB disk

    6 GB for a 9 GB disk

    ~25 GB for a 27 GB disk

Figure 4 is an example of disk partitions for a 2.1 GB disk.

Disk: c0t0d0		Disk Size: **2.1 GB**
0	**/**	**50 MB**
1	**swap**	**300 MB**
2	**overlap**	*Based on disk size*
3	**/var**	**40 MB**
4	**/export/home**	**600 MB**
5	**/opt**	**40 MB**
6	**/usr**	**600 MB**
7	**/export/backup** (remainder of disk space)	*(~400 MB)*
	Capacity:	*disk size*
	Allocated:	*yy*MB or GB
	Free:	*xx*MB or GB

Figure 4.   Defining Primary Disk Partitions for a 2.1 GB disk.

Figure 5 is an example of disk partitions for a 19 GB disk.

Disk: c0t0d0		Disk Size: **19 GB**
0	**/**	**100 MB**
1	**swap**	**512 MB**
2	**overlap**	*Based on disk size*
3	**/var**	**2,000 MB**
4	**/export/home**	**2,000 MB**
5	**/opt**	**1,000 MB**
6	**/usr**	**2,000 MB**
7	**/export/backup** (remainder of disk space)	*(~11,000 MB)*
	Capacity:	*disk size*
	Allocated:	*yy*MB or GB
	Free:	*xx*MB or GB

Figure 5.   Defining Primary Disk Partitions

36. Define the entire second disk as a single partition called `/second-disk`. Assign the entire second disk size to this partition.

37. Press `OK` after you have filled out the `Customize Disks` screen.

    The `File System and Disk Layout` screen appears.

38. Are the file systems and disk layout correct in the `File System and Disk Layout` screen?

YES	Press `Continue` to accept the layout displayed.
NO	Press `Customize...` to change the file system or layout information.

39. Press `Continue` in the `Mount Remote File Systems?` screen.

40. Verify that the `Profile` screen displays the configuration that you want and press `Begin Installation`.

41. Press `Auto Reboot` in the next screen.

    The installation process takes from 30 minutes to 2 hours depending on the speed of the CD–ROM drive. The system activities can be monitored by following the messages in the `Solaris Install Console` and by the `Installing Solaris Software - Progress` screen, which shows the progress with a sliding bar.

42. When the installation is complete, the system reboots and prompts for a password. Enter a password. Reenter the same password at the prompt to verify.

    The system then returns to the login prompt.

43. Press n to the question `Do you want the system to ask about this again, when you next reboot?`

    This allows you to try this option before keeping it.

44. Specify the media from which you are installing Solaris 8 Software.

    Select one of the following:

    ○ CD

    ○ Network File System

45. Click Skip to skip the installation of Solaris 8 Software. You must then **reboot**.

46. Enter

    eject cdrom

47. Remove and store the CD–ROM.

    Complete the installation by editing the `hosts` file to add the name of the host(s) and the IP address(es).

48. Change directories to the /etc directory.

cd /etc

49. Edit the hosts file: add the name of each client and the IP address of each client to the end of the file.

50. At the system prompt enter **df -k** to verify the following:

○ The total KB space available is at least 600000 for the /export/home file system for the database. /export/home will contain the contents of the installation media.

○ The total space available for /export/backup is at least 400000 KB for the database. See Step 35 for suggested sizes of /export/backup for different disk sizes.

Verifying Disk Space

Before installing ACSLS, verify that the hard disk was partitioned appropriately when the operating system was installed and configured.

➪ **To verify disk partitions:**

1. At the system prompt enter **df -k** to verify the following:

○ The total KB space available for the /export/home file system, where ACSLS will reside, is at least:

600000 KB for a 2.1 GB disk

800000 KB for a 9 GB disk

800000 KB for a 27 GB disk

○ The total KB space available for /export/backup is at least:

400000 KB for a 2.1 GB disk

6000000 KB for a 9 GB disk

25000000 KB for a 27 GB disk

Step 4: Preparing for ACSLS Installation

Before you install ACSLS, complete the following steps:

1. Verify that the server system hardware is properly configured, connected, powered on, and ready.

2. If your installation includes a 9300 or 4400 library and a single serial LMU:

   a. Connect the LMU to serial port-b.

   b. If a modem is not used, connect both serial ports to the LMU for redundant communications.

3. If your installation includes a 9300 or 4400 library and dual serial 9330 LMUs:

   a. Refer to *Serial Parallel Controller User's Guide* (Sun P.N. 800–6573–12) for installation instructions of the serial parallel controller card and connection of the serial patch panel.

   b. Attach the serial patch panel to the SBus slot on the server.

   c. From the serial patch panel, run 2 cables to each LMU (see Figure 6).

Figure 6.   Dual LMU Connection Configuration

4. If your installation includes a 9300 library and TCP/IP LMU(s), connect the TCP/IP LMU(s) to the network used for LMU communication.

5. If your installation includes a SCSI library and:

   ○ single-ended SCSI interface

      Verify proper SCSI cable terminator attachment.

      Make sure that the cable does not exceed 2 meters between the server and the SCSI library.

      Note: If the single–ended bus you are using is the embedded system bus, then precautions should be taken to prevent system disk corruption. Noises on the system bus can corrupt data bound for the system disk. Common sources of spurious noise should be avoided, including:

         Hot plugging devices on the SCSI bus.

         Attaching cables that are not actively terminated.

         Powering down an attached peripheral while UNIX is running.

      Verify the proper SCSI target address. Consult the appropriate SCSI hardware operator's guide for setting this address on the LSM.

      Note: Set the SCSI library at SCSI target 0, target 2, or target 5 for a standard Solaris platform.

      Note: Typically, target 1 is reserved for a second disk, target 3 is reserved for a boot disk, target 4 is reserved for an external tape device, target 6 is reserved for a CD-ROM, and target 7 is reserved for a SCSI controller.

      Note: If 1, 3, 4, 6, or 7 are already reserved on your system, use 0, 2, or 5 for your SCSI library.

   ○ differential SCSI interface

Verify proper SCSI cable terminator attachment.

Make sure the cable does not exceed 20 meters.

6. Make sure that each attached LMU and LSM is fully configured, powered on, and ready.

   Note: The configuration script, `acsss_config`, will fail unless all LMUs and LSMs are fully configured, powered on, and ready.

7. If you have any communication problems refer to Appendix B. "Troubleshooting."

8. If you intend to use removable media for database backup, have a blank cartridge available for your backup tape device to complete the configuration process.

9. ACSLS requires specific user IDs. If these user IDs are not defined before ACSLS installation, ACSLS creates them. When ACSLS installation creates the user IDs, the system assigns the user ID numbers and group ID numbers. To assign specific user ID and group ID numbers, you must define the following groups and users before installing ACSLS:

User	Group
acsss	staff
acssa	staff
lib6	staff
informix	informix

When these user IDs are defined before ACSLS installation, they can either be defined locally (on the ACSLS server) or via remote authentication methods (e.g., NIS or Kerberos). These user IDs must be defined with the following properties:

- ○ The shell for these user IDs must be `sh` on Solaris.

- ○ The home directories for the `acsss`, `acssa`, and `informix` user IDs must be under the ACSLS installation directory. By default, the ACSLS

installation directory is /export/home (referred to as $BASEDIR). The home directories for the ACSLS user IDs are:

   acsss   **$BASEDIR/ACSSS**
   acssa   **$BASEDIR/ACSSA**
   informix **$BASEDIR/informix**

If the home directories for the ACSLS user IDs do **not** match their required locations, please either modify the home directories for these users or delete the user IDs so they are added correctly during the ACSLS installation process.

The following command creates the acsss user on Solaris. (You must be logged in as root.)

```
useradd -d $BASEDIR/ACSSS -g staff -s /bin/sh -c "ACSLS Control Login" acsss
```

The account information is:

```
acsss    -d $BASEDIR/ACSSS           -g staff   -c "ACSLS Control Login"              -s /bin/sh
acssa    -d $BASEDIR/ACSSA           -g staff   -c "ACSLS SA Login"                   -s /bin/ksh
informix -d $BASEDIR/informix/IDS7.3 -g informix -c "ACSLS Informix Database Owner" -s /bin/sh
lib6     -d $BASEDIR/ACSSS           -g staff                                         -s /bin/sh
```

The following commands modify the acsss, acssa, and informix users' home directories. (You must be logged in as root.)

```
usermod -d $BASEDIR/ACSSS acsss
usermod -d $BASEDIR/ACSSA acssa
usermod -d $BASEDIR/informix informix
```

Step 5: Installing ACSLS

⇨   **Remove any previous version**

1.   Have your license key available.

2.   Is this a new installation?

YES	Go to the *Install using pkgadd* section in this chapter
NO	Make sure you exported the database by using the db_export.sh utility command.

3.   Shut down ACSLS:

You need to be logged in as **acsss** to do this.

a.   Enter the following:

> **idle** (from a cmd_proc)
> **kill.acsss** (from a command prompt)

b.   Enter one of the following, depending on the ACSLS release from which you are upgrading:

○   If you are upgrading from ACSLS 5.3 or 5.3.2:

> **db_command stop**

○   If you are upgrading from ACSLS 5.4:

> **db_command.sh stop**

○   If you are upgrading from ACSLS 6.0 or 6.0.1:

> **db_command stop**
>
> **db_command ism_stop**

4. Login as `root` and remove ACSLS, backup and other files:

    For ACSLS 5.3 or 5.3.2, enter:

    - ○ **`cd /export/home`**
    - ○ **`rm -rf ACSSS oracle`**
    - ○ **`cd  /export/backup`**
    - ○ **`rm -rf oracle misc`**

    For ACSLS 5.4, enter:

    - ○ **`cd /export/home`**
    - ○ **`rm -rf ACSSS sybase`**
    - ○ **`cd /export/backup`**
    - ○ **`rm -rf sybase misc`**

    For ACSLS 6.0 or 6.0.1, enter:

    - ○ **`cd /export/home`**
    - ○ **`rm -rf ACSSS informix`**
    - ○ **`cd /export/backup`**
    - ○ **`rm -rf informix misc`**

         If the server_to_server directory exists, enter:

         `rm -rf informix misc server_to_server`
    - ○ **`cd /`**
    - ○ **`rm -rf INFORMIXTMP nsr`**

5. Remove files under second disk (if installed)

    - ○ **`cd /second_disk`**

         If you installed the second disk in another directory other than /second_disk, cd to that directory.
    - ○ **`rm -rf data`**
    - ○ **`cd /second_disk/backup`**

         If you installed the second disk in another directory other than /second_disk/backup, cd to that directory.

    For ACSLS 5.3 or 5.3.2, enter:

    ○ **rm -rf oracle misc**

For ACSLS 5.4, enter:

    ○ **rm -rf sybase misc**

For ACSLS 6.0 or 6.0.1, enter:

    ○ **rm -rf informix misc**

6. If you want to reinstall ACSLS in a different ACSLS installation directory, either delete the acsss, acssa, and informix user IDs or modify their home directories to be under the new ACSLS installation directory.

   By default, the ACSLS installation directory is /export/home (referred to as $BASEDIR). The home directories for the ACSLS user IDs are:

   ○ acsss – **$BASEDIR/ACSSS**

   ○ acssa – **$BASEDIR/ACSSA**

   ○ informix – **$BASEDIR/informix**

   The following commands modify the above users' home directories. (You must be logged in as root.)

   ```
   usermod -d $BASEDIR/ACSSS acsss
   usermod -d $BASEDIR/ACSSA acssa
   usermod -d $BASEDIR/informix informix
   ```

7. Reboot to verify that no database processes are running before you begin the install.

➡ **Install using pkgadd:**

1. Log in as **root**.

2. Insert the ACSLS 6.1.1 CD-ROM.

3. In a terminal window or at the system prompt, enter

   cd /cdrom/cdrom0/Solaris

4. Install using pkgadd:

pkgadd −d .

Note: A space and a period must be entered after the command pkgadd −d.

pkgadd asks what package you want installed.

5. When prompted to select a package, select STK acsls and press <return>.

6. Enter **y** or **n** at the prompt to install ACSLS in the default directory /export/home/.

Use the default directory /export/home or enter the directory where you want ACSLS installed.

7. Type **y** to at the prompt to install setuid/setgid files.

8. Type **y** at the prompt to install STKacsls.

User and group IDs are created (unless they already exist). Files being installed are displayed.

If the acsss, acssa, or informix user IDs are not defined with their home directories matching the ACSLS installation directory, the installation script displays a warning, for example:

```
***WARNING*** User acsss already exists, but
its home directory does not match the ACSLS
installation directory.  Please change the
acsss home directory to /export/home/ACSSS
after the installation.
```

If the acsss, acssa, or informix user IDs are created during installation, a default password is not created. You need to go into the admintool to create a password.

9. Type **q** when prompted again to exit the pkgadd menu.

10. Type **cd /**

11. Eject the CD–ROM.

    eject cdrom

➯ **Apply any desired maintenance to ACSLS.**

This ensures that any maintenance is applied before ACSLS is installed.

➯ **Install ACSLS software:**

1. Change directories:

   cd /export/home/ACSSS/install

2. To initiate the installation shell script, enter

   ./install.sh

   If shared memory settings have *not* been defined, you are prompted to allow the script to set shared memory and reboot the server:

   ```
   This server is not set with shared memory
   required for ACSLS and the Database.
   ```

   ```
   Set shared memory and reboot the server to take
   effect at kernel level? (y or n):
   ```

   Respond **y** to the prompt.

   The server reboots.

   When the server comes back, log in as **root**, cd to /export/home/ACSSS/install (if you are not already in it), and restart install.sh.

3. Enter the database backup directory.

4. Respond **y** or **n** to the prompt for automatic startup on reboot.

Option: If you have a SCSI–attached Library continue with steps 5 and 6

5. Respond (y or n) to the prompt for installing a SCSI device driver for SCSI libraries.

   ```
   Do you want to install the scsi device driver
   for SCSI libraries? (y or n):
   ```

YES	The following message displays:
	`Enter the SCSI device(s) that correspond to each library. Separate devices with a space (example: 4 5 6). Remember that SCSI devices are numbers between 0 and 15.`
	Notes:
	• On most Solaris machines, target-7 is not a valid device address because target-7 is reserved for the SCSI initiator on the host-bus adapter.
	• If you are not sure what numbers to enter in this step follow the procedures in *Verifying the SCSI Library Connection* in "Appendix B: Troubleshooting" .
	Continue with Step 6.

6. Respond (y or n) to the prompt after the specified SCSI device numbers display.

   ```
   Is this correct? (y or n):
   ```

7. The following message is displayed:

   ```
   install.sh 1501: You can enable/disable second
   disk support later as root by doing the UNIX
   command "cd /export/home/ACSSS/install;
   ./sd_mgr.sh".
   ```

   You can enable second disk support after you complete the procedures in this chapter. See Appendix A, "Second Disk Support".

8. Set the ACSLS user passwords.

   You need to set the following password to prevent a security exposure: `acsss`, `acssa`, `informix`, and `lib6.`

   You must set the passwords the first time you login to these IDs. To set the passwords:

   a. Login to each of the above user IDs.

   b. Enter the password at the prompt.

9. If the `acsss`, `acssa`, or `informix` user IDs were not defined with their home directories matching the ACSLS installation directory, and the installation script displayed a warning, modify these user IDs so that their home directories are under the ACSLS base directory.

   The following commands modify the above users' home directories. (You must be logged in as `root`.)

   ```
   usermod -d $BASEDIR/ACSSS acsss
   usermod -d $BASEDIR/ACSSA acssa
   usermod -d $BASEDIR/informix informix
   ```

Step 6: Import the database

In the following cases, you need to import the data from a previous ACSLS release. They are:

- If you are migrating from a previous release.

- If you are re–installing ACSLS.

Refer to "Chapter 11: Database Backup and Restore," *Importing the Database*.

Step 7: Configure your library hardware

Warning: If you imported data from a previous ACSLS release, you must start ACSLS and ensure all LSMs are online before configuring your library hardware. Then shut down ACSLS. This initializes the LSM types and protects your imported database information.

Note: You do not need to run acsss_config if you are not changing your library hardware. Go to step 8.

You must run acsss_config to configure you libraries if:

- this is a new installation,

- you are adding library hardware

Refer to "Chapter 7: Configuring your Library Hardware".

Step 8: Enter your License Key Information

You must enter a license key to activate ACSLS. To avoid unnecessary delays obtain your license key before you begin the ACSLS installation.

Refer to "Chapter 2: ACSLS License Key" for procedures.

Step 9: Reset any Custom Dynamic or Static Variables.

If you are migrating to ACSLS 6.1.1 from a previous release and have customized your dynamic or static variables, you need to reset them.

Refer to "Chapter 6: Verifying and Changing Your Static and Dynamic Variables" for procedures.

Step 10: Configure the Second Disk.

After installing and configuring ACSLS on the primry disk, configure the second disk as described in "Appendix A: Second Disk Support."

Step 11: Audit new libraries.

You need to audit your libraries:

- If this is a new installation.

- If you are adding new libraries to an existing configuration.

Step 12: Verify ACSLS Installation

Use the following procedure to mount or dismount a volume to verify ACSLS.

➡️   **Mount/dismount a volume to verify ACSLS:**

1. Verify you are logged in as acsss.

2. If ACSLS is not running, start it by entering

    rc.acsss

3. Query the server from the cmd_proc by entering

    query server

    If messages are displayed indicating that the server is in recovery mode, wait for a message indicating that the server is running.

4. Verify that the following are online. You must have at least one of each online. If not, bring them online with the `vary` command.

   query port all

   query acs all

   query lsm all

   query drive all

5. Do you have at least one volume in an LSM?

YES	Continue with the procedure.
NO	Enter a volume into an LSM.

6. Mount a volume by entering:

   mount *vol_id drive_id*

   Hint: Use the **q**uery **dr**ive command to get the ID of an available drive and the **q**uery **vo**lume command to get the ID of a library volume. See "Chapter 14: Command Reference."

7. Did you see a message indicating a successful mount?

   A successful mount message is:

   Mount: *vol_id* mounted on *drive_id*

YES	Procedure is complete.
NO	If an error message appears, run this verification procedure again, ensuring that you specified a valid, available drive and a library volume. If the mount/dismount still fails, call StorageTek for assistance.

8. Dismount the volume by entering:

   dismount *vol_id drive_id* **force**

   where *vol_id* is the volume and *drive_id* is the drive you specified in Step 6.

ACSLS Setup for Client Communication

To set up ACSLS for client communication, you include the client host name and IP address in /etc/hosts or in the NIS lookup table.

Regressing to a Previous Version of ACSLS

If you need to regress to a previous version of ACSLS after you install ACSLS 6.1.1, you need to perform the following steps:

- Export the database and save it on a tape or file external to the server.

- Uninstall ACSLS 6.1.1 as described in the steps below:

- Install the previous version of ACSLS

For assistance in regressing to a previous version, contact StorageTek Software Support. For more information, see *Requesting Help from Software Support*.

Uninstalling ACSLS 6.1.1

To uninstall ACSLS 6.1.1:

1. Log in as acsss.

2. Shut down ACSLS.
   kill.acsss

3. Shut down the Informix database:
   db_command stop
   db_command ism_stop

4. Remove pkgadd:

    ○ Log in as **root.**

    ○ Enter **pkgrm STKacsls**

5. Perform a file cleanup for the primary disk:

    ○ **cd /export/home**

        If you installed ACSLS in another directory other
        than /export/home, cd to that directory.

    ○ **rm -rf ACSSS informix**

    ○ cd **/export/backup**

        If you installed ACSLS backup in another directory
        other than /export/backup, cd to that directory.

    ○ **rm -rf informix misc server_to_server**

    ○ **cd /**

    ○ **rm -rf INFORMIXTMP nsr**

6. Perform a file cleanup for the second disk:

    ○ **cd /second_disk**

        If you installed the second disk in another directory
        other than /second_disk, cd to that directory.

    ○ **rm -rf data**

    ○ **cd /second_disk/backup**

        If you installed the second disk in another directory
        other than /second_disk/backup, cd to that directory.

    ○ **rm -rf informix misc**

7. If you want to reinstall ACSLS in a different ACSLS
    installation directory, either delete the acsss, acssa and

`informix` user IDs or modify their home directories to place them under the new ACSLS installation directory.

By default, the ACSLS installation directory is /export/home (referred to as $BASEDIR). The home directories for the ACSLS user IDs are:

- ○ acsss – **$BASEDIR/ACSSS**

- ○ acssa – **$BASEDIR/ACSSA**

- ○ informix – **$BASEDIR/informix**

8. Reboot.

Chapter 4. Installing ACSLS on Solaris 9

ACSLS 6.1.1 supports Solaris 8 and 9. StorageTek does not support down level versions of the operating system for this release. This chapter describes procedures for installing ACSLS on Solaris 9.

To apply any maintenance, refer to the installation instructions in the associated PUT or SPE or PTF document included with the CD–ROM, or the document associated with the maintenance tar file on the StorageTek Customer Resource Center (CRC) web page.

This chapter takes you through and discusses the following steps for installing ACSLS on Solaris 9. In these steps:

1. Have your license key information and ACSLS 6.1.1 CD–ROM available.

2. Backup and export the database if you are upgrading from a previous version of ACSLS (see *Exporting the Database* in "Chapter 11: Database Backup and Restore").

3. Prepare for Solaris 9 installation.

4. Install the Solaris 9 operation system.

5. Prepare for ACSLS installation.

6. Install ACSLS.

7. Import the database from any previous version.

8. Run acsss_*config* to configure your library hardware (see "Chapter 7: Configuring your Library Hardware").

9. Enter your license key information (see "Chapter 2: ACSLS License Key").

10. Reset any custom dynamic or static variables.

11. Audit new libraries.

12. Verify the ACSLS installation.

In addition, this chapter discusses:

- ACSLS Setup for Client Communication

- Regressing to a previous version of ACSLS

- Uninstalling ACSLS 6.1.1

Step 1: Backup and Export the Database

Perform this step if you are upgrading from a previous version of ACSLS (see the section for *Exporting the Database* in "Chapter 11: Database Backup and Restore").

Step 2: Preparing for Solaris Installation

Before installing Solaris, complete the following steps:

1. Have your license key information and ACSLS 6.1.1 CD–ROM available.

2. Satisfy all requirements specified in *Product Information* (see "ACSLS Online Information on the StorageTek CRC") prior to installation of Solaris or ACSLS.

3. Install the library hardware according to the StorageTek installation instructions.

    Note: If you are installing a SCSI library, you should connect the server to the library before installing ACSLS. The install.sh script installs device drivers and kernel patches. If the SCSI cable is not connected, the device driver installation fails. However, if library hardware is not

available at the time of software installation, the driver can be installed separately at a later time.

4. Install the ACSLS server hardware according to the hardware manufacturer's instructions.

5. Determine and record information about network communication settings.

Caution: Consult your system administrator for assistance in obtaining this information. It is critical that this information is correct in order for ACSLS to run properly.

Table 4.   Pre-Installation Worksheet

Installation Options	Your System Values
❏ Host Name	
❏ Network Adapter	
❏ Internet Protocol Address	
❏ Name Service	
❏ Network Mask	
❏ Domain Name	
❏ Gateway Address	
❏ Name Server	
❏ Subnets	
❏ System Type	

Step 3: Installing the Solaris 9 Operating System

⇨   **To install the Solaris 9 operating system:**

1. Boot your system from the CD–ROM containing the
    Solaris operating system:

    Insert the Solaris CD (**Solaris 9 Software**) into the
    CD-ROM drive. This is CD–1 (of 2).

    STOP   **Do** *not* **insert the Solaris 9 Installation CD.** Doing
    this installs the incorrect version for using ACSLS.

    a.   Press ⟦STOP⟧+A.

    b.   From the ok prompt, enter

         boot cdrom

         Press ⟦ENTER⟧.

    Note: If you have configured the SCSI/Ethernet card on
    your server and you are not using the second Ethernet
    connection, then disregard the message, "home1: link
    down".

    Hint: The Solaris Install Console will appear first.
    During the installation process, this console provides
    messages indicating what the system is doing.

2. Select Language.

    The choices are 0–9. The menu explains each choice.

3. Select Locale options.

    sysidtool is started. Press F2 twice to continue.

4. In the Network Connectivity window, select yes and
    then F2 to continue.

5. In the DHCP window, unless you are using DHCP, select no
    and F2 to continue

6. In the `Primary Network Interface` window, enter the device name and press F2 to continue.

7. In the `Host Name` window, enter the Host Name for your system and press F2 to continue.

8. Enter your IP address in the IP Address window and press F2 to continue.

9. Select `yes` in the Subnet window if the system on a subnet. Enter `no` is it is a standalone.

10. Press F2 in the Net Mask window if the information is correct.

11. To enable IPv6 select `no`; press F2.

12. Make a selection in the Default Route window.

    A confirmation window displays notifying you that it is looking for the route. Once it displays the route, press F2 to continue.

13. Confirm the `Host Name`, `Networked`, and `IP address` in the `Confirm Information` window, and press F2.

14. Select `no` for `Configure Security Policy` and press F2.

15. Confirm Kerbous security.

16. In the `Primary Network Interface` window, enter your device name and then select F2.

17. Select the name service used in your network in the `Name Service` window, and press F2.

    Notes:

    ○ Select `none`

    ○ Do *not* select the `NIS+` or `NIS` or `DNS` services unless your system administrator can configure these services correctly.

○ If one of these services is selected, a number of different prompts appear. Respond to these prompts appropriately.

18. Confirm the `Name Service` in the `Confirm Information` window, and press F2.

19. Specify your time zone type in the `Geographical Regions` window and press F2.

20. Enter the country and region and press F2.

21. Enter the current date and time (if required) in the `Date and Time` window and press F2

22. Press F2 on the `Confirm Information` window.

    The `Solaris Interactive Installation` window displays.

    Select `Initial`.

23. The `Solaris Interactive Installation` window displays a message similar to the following.

    `There are two ways to install`

    The choices are: standard or Flash.

24. Select F2 – standard.

25. Verify your regions setting in the `Select Geographic Regions` window and press F2.

26. `Select to Include Solaris 64 Bit Support` to enable 64-bit support. (This applies to SUN Ultra platforms.).

27. Select the end user and press F4 to customize

    The `Customize Software` window displays displaying the `Software Clusters and Packages` window.

28. Scroll down and locate `On-Line Manual Pages` in the window. Click once to fully select the `Man Pages`.

29. Continue scrolling down and locate `OpenWindows Version 3` in the window.

30. Select 64–bit and press the space bar to fully select the option.

31. Continue to scroll down through the main directory to `Programming tools and libraries`.

    a. Select the triangular arrow (`Collapsed Cluster`) in the left margin of `Programming tools and libraries` to expand the subdirectory.

    b. Select `CCS tools bundled with SunOS`.

    c. Select the triangular arrow (`Collapsed Cluster`) in the left margin of `Programming tools and libraries` to close the subdirectory.

32. Press `OK` to exit the `Customize Software` window.

33. Press `F2` when the `Select Software` window displays.

34. If the boot disk is displayed in the `Available Disks` window, select it, then press the single-right-arrow button to move it to the "Selected disks" column.

    Repeat this step for the second disk and move it in the second column.

35. Press `F2` on the `Select Disks` window.

    The `Preserve Data?` window displays.

36. Press `F2` for a new installation and/or to overwrite current file systems and unnamed file systems. (Press `Preserve...` to preserve existing data during an upgrade installation.)

37. Press `Manual Layout` in the `Automatically Layout File Systems?` window and F4.

38. Press `Customize` in the `File System and Disk Layout` window to define disk partitions for ACSLS. Press F4 to customize.

    The `Customize Disks` window displays.

39. Select the disk to customize and press F4.

In the following discussion, /export/home is used as the directory where ACSLS is installed; however, in this release ACSLS now installs to any directory in Solaris. You can now install ACSLS in any directory.

Enter the values specified to define primary disk partitions for the database:

○ Assign the mount point for each of the eight partitions in the left column.

○ Assign the size for each slice in the right column except for /export/backup.

Do *not* make root any smaller than 50 MB.

Swap space must be no smaller than 300 MB.

The size of /usr must be at least 700 MB.

/export/home must be at least:

   600 MB for a 2.1 GB disk

   1 GB for a 9 GB or larger disk

For information about determining the size of your primary and secondary disks, see *ACSLS Product Information*, "Determining Disk Size Requirements".

○ Assign /export/backup *last.* Assign /export/backup the amount displayed in Free: after entering all other values. You should have no less than:

   400 MB for a 2.1 GB disk

   6 GB for a 9 GB disk

   ~25 GB for a 27 GB disk

Figure 4 is an example of disk partitions for a 2.1 GB disk.

Disk: c0t0d0		Disk Size: **2.1 GB**
0	**/**	**50 MB**
1	**swap**	**300 MB**
2	**overlap**	*Based on disk size*
3	**/var**	**40 MB**
4	**/export/home**	**600 MB**
5	**/opt**	**40 MB**
6	**/usr**	**600 MB**
7	**/export/backup** (remainder of disk space)	*(~400 MB)*
	Capacity:	*disk size*
	Allocated:	*yy*MB or GB
	Free:	*xx*MB or GB

Figure 7.   Defining Primary Disk Partitions for a 2.1 GB disk.

Figure 5 is an example of disk partitions for a 19 GB disk.

Disk: c0t0d0	Disk Size: **19 GB**
0	**/**	**100 MB**
1	**swap**	**512 MB**
2	**overlap**	*Based on disk size*
3	**/var**	**2,000 MB**
4	**/export/home**	**2,000 MB**
5	**/opt**	**1,000 MB**
6	**/usr**	**2,000 MB**
7	**/export/backup** (remainder of disk space)	*(~11,000 MB)*
	Capacity:	*disk size*
	Allocated:	*yy*MB or GB
	Free:	*xx*MB or GB

Figure 8.   Defining Primary Disk Partitions

40. Press F2 to continue.

41. Select the second drive to customize and press F4.

42. Define the entire second disk as a single partition called /second-disk. Assign the entire second disk size to this partition.

43. Press OK after you have filled out the Customize Disks window.

    The File System and Disk Layout window displays.

44. Are the file systems and disk layout correct in the File System and Disk Layout window?

YES	Press F2 to accept the layout displayed.
NO	Press Customize... to change the file system or layout information.

45. Press F2 in the `Mount Remote File Systems?` window.

46. Verify that the `Profile` window displays the configuration that you want and press `Begin Installation`.

47. Select `Auto Reboot` in the next window and press F2 to begin the installation.

    The installation process takes from 30 minutes to 2 hours depending on the speed of the CD–ROM drive. The system activities can be monitored by following the messages in the `Solaris Install Console` and by the `Installing Solaris Software - Progress` window, which shows the progress with a sliding bar.

48. When the installation is complete, the system reboots and prompts for a password. Enter a password. Reenter the same password at the prompt to verify.

49. A message similar to the following displays:

    `This system is configured to conserve energy.`
    `Do you want this automatic power saving`
    `shutdown?`

50. Select n.

    A message similar to the following displays:

    `Do you want this system to ask about this`
    `again?`

51. Select n.

52. Specify the media from which you are installing Solaris 9 Software.

Select one of the following:

- ○ CD

- ○ Network File System

53. Insert **Solaris 9 Software – CD 2 of 2** when prompted and click OK.

54. Click Next.

    The cd is ejected.

55. Click Reboot Now.

56. Change directories to the /etc directory.

    cd /etc

57. Edit the hosts file: add the name of each client and the IP address of each client to the end of the file.

58. At the system prompt enter **df -k** to verify the following:

    - ○ The total KB space available is at least 600000 for the /export/home file system for the database. /export/home will contain the contents of the installation media.

    - ○ The total space available for /export/backup is at least 400000 KB for the database. See Step 39 for suggested sizes of /export/backup for different disk sizes.

Verifying Disk Space

Before installing ACSLS, verify that the hard disk was partitioned appropriately when the operating system was installed and configured.

➪   **To verify disk partitions:**

1. At the system prompt enter **df -k** to verify the following:

    ○ The total KB space available for the /export/home
      file system, where ACSLS will reside, is at least:

        600000 KB for a 2.1 GB disk

        800000 KB for a 9 GB disk

        800000 KB for a 27 GB disk

    ○ The total KB space available for /export/backup is
      at least:

        400000 KB for a 2.1 GB disk

        6000000 KB for a 9 GB disk

        25000000 KB for a 27 GB disk

Step 4: Preparing for ACSLS Installation

Before you install ACSLS, complete the following steps:

1. Verify that the server system hardware is properly
    configured, connected, powered on, and ready.

2. If your installation includes a 9300 or 4400 library and a
    single serial LMU:

    a. Connect the LMU to serial port-b.

    b. If a modem is not used, connect both serial ports to
        the LMU for redundant communications.

3. If your installation includes a 9300 or 4400 library and
    dual serial 9330 LMUs:

    a. Refer to *Serial Parallel Controller User's Guide*
        (Sun P.N. 800–6573–12) for installation instructions

of the serial parallel controller card and connection of the serial patch panel.

b. Attach the serial patch panel to the SBus slot on the server.

c. From the serial patch panel, run 2 cables to each LMU (see Figure 9).

Figure 9.   Dual LMU Connection Configuration

4. If your installation includes a 9300 library and TCP/IP LMU(s), connect the TCP/IP LMU(s) to the network used for LMU communication.

5. If your installation includes a SCSI library and:

○ single-ended SCSI interface

Verify proper SCSI cable terminator attachment.

Make sure that the cable does not exceed 2 meters between the server and the SCSI library.

Note: If the single–ended bus you are using is the embedded system bus, then precautions should be taken to prevent system disk corruption. Noises on the system bus can corrupt data bound for the system disk. Common sources of spurious noise should be avoided, including:

Hot plugging devices on the SCSI bus.

Attaching cables that are not actively terminated.

Powering down an attached peripheral while UNIX is running.

Verify the proper SCSI target address. Consult the appropriate SCSI hardware operator's guide for setting this address on the LSM.

Note: Set the SCSI library at SCSI target 0, target 2, or target 5 for a standard Solaris platform.

Note: Typically, target 1 is reserved for a second disk, target 3 is reserved for a boot disk, target 4 is reserved for an external tape device, target 6 is reserved for a CD-ROM, and target 7 is reserved for a SCSI controller.

Note: If 1, 3, 4, 6, or 7 are already reserved on your system, use 0, 2, or 5 for your SCSI library.

○ differential SCSI interface

Verify proper SCSI cable terminator attachment.

Make sure the cable does not exceed 20 meters.

6. Make sure that each attached LMU and LSM is fully configured, powered on, and ready.

Note: The configuration script, `acsss_config`, will fail unless all LMUs and LSMs are fully configured, powered on, and ready.

7. If you have any communication problems refer to the troubleshooting chapter in the appendix.

8. If you intend to use removable media for database backup, have a blank cartridge available for your backup tape device to complete the configuration process.

9. ACSLS requires specific user IDs. If these user IDs are not defined before ACSLS installation, ACSLS creates them. When ACSLS installation creates the user IDs, the system assigns the user ID numbers and group ID numbers. To assign specific user ID and group ID numbers, you must define the following groups and users before installing ACSLS:

User	Group
acsss	staff
acssa	staff
lib6	staff
informix	informix

When these user IDs are defined before ACSLS installation, they can either be defined locally (on the ACSLS server) or via remote authentication methods (e.g., NIS or Kerberos). These user IDs must be defined with the following properties:

○ The shell for these user IDs must be `sh` on Solaris.

○ The home directories for the `acsss`, `acssa`, and `informix` user IDs must be under the ACSLS installation directory. By default, the ACSLS installation directory is /export/home (referred to as $BASEDIR). The home directories for the ACSLS user IDs are:

acsss	**$BASEDIR/ACSSS**
acssa	**$BASEDIR/ACSSA**
informix	**$BASEDIR/informix**

If the home directories for the ACSLS user IDs do **not** match their required locations, please either modify the home directories for these users or delete the user IDs so they are added correctly during the ACSLS installation process.

The following command creates the `acsss` user on Solaris. (You must be logged in as `root`.)

```
useradd -d $BASEDIR/ACSSS -g staff -s /bin/sh -c "ACSLS Control Login" acsss
```

The account information is:

```
acsss    -d $BASEDIR/ACSSS         -g staff    -c "ACSLS Control Login"          -s /bin/sh
acssa    -d $BASEDIR/ACSSA         -g staff    -c "ACSLS SA Login"              -s /bin/ksh
informix -d $BASEDIR/informix/IDS7.3 -g informix -c "ACSLS Informix Database Owner" -s /bin/sh
lib6     -d $BASEDIR/ACSSS          -g staff                                    -s /bin/sh
```

The following commands modify the `acsss, acssa,` and `informix` users' home directories. (You must be logged in as `root`.)

```
usermod -d $BASEDIR/ACSSS acsss
usermod -d $BASEDIR/ACSSA acssa
usermod -d $BASEDIR/informix informix
```

Step 5: Installing ACSLS

⇨ **Remove any previous version**

1. Have your license key available.

2. Is this a new installation?

YES	Go to the *Install using pkgadd* section in this chapter
NO	Make sure you exported the database by using the db_export.sh utility command.

3. Shut down ACSLS:

You need to be logged in as **acsss** to do this.

   a. Enter the following:

       idle (from a cmd_proc)
       kill.acsss (from a command prompt)

    b. Enter one of the following, depending on the ACSLS release from which you are upgrading:

    ○ If you are upgrading from ACSLS 5.3 or 5.3.2:

       db_command stop

    ○ If you are upgrading from ACSLS 5.4:

       db_command.sh stop

    ○ If you are upgrading from ACSLS 6.0 or 6.0.1:

       db_command stop

       db_command ism_stop

4. Login as root and remove ACSLS, backup and other files:

For ACSLS 5.3 or 5.3.2, enter:

    ○ **cd /export/home**
    ○ **rm -rf ACSSS oracle**
    ○ **cd /export/backup**
    ○ **rm -rf oracle misc**

For ACSLS 5.4, enter:

    ○ **cd /export/home**
    ○ **rm -rf ACSSS sybase**
    ○ **cd /export/backup**
    ○ **rm -rf sybase misc**

For ACSLS 6.0 or 6.0.1, enter:

    ○ **cd /export/home**
    ○ **rm -rf ACSSS informix**
    ○ **cd /export/backup**
    ○ **rm -rf informix misc**

      If the server_to_server directory exists, enter:

      rm -rf informix misc server_to_server
    ○ **cd /**

- ○ **rm -rf INFORMIXTMP nsr**

5. Remove files under second disk (if installed)

  - ○ **cd /second_disk**

    If you installed the second disk in another directory other than /second_disk, cd to that directory.

  - ○ **rm -rf data**

  - ○ **cd /second_disk/backup**

    If you installed the second disk in another directory other than /second_disk/backup, cd to that directory.

  For ACSLS 5.3 or 5.3.2, enter:

  - ○ **rm -rf oracle misc**

  For ACSLS 5.4, enter:

  - ○ **rm -rf sybase misc**

  For ACSLS 6.0 or 6.0.1, enter:

  - ○ **rm -rf informix misc**

6. If you want to reinstall ACSLS in a different ACSLS installation directory, either delete the acsss, acssa, and informix user IDs or modify their home directories to be under the new ACSLS installation directory.

   By default, the ACSLS installation directory is /export/home (referred to as $BASEDIR). The home directories for the ACSLS user IDs are:

   - ○ acsss – **$BASEDIR/ACSSS**

   - ○ acssa – **$BASEDIR/ACSSA**

   - ○ informix – **$BASEDIR/informix**

   The following commands modify the above users' home directories. (You must be logged in as root.)

   ```
   usermod -d $BASEDIR/ACSSS acsss
   usermod -d $BASEDIR/ACSSA acssa
   usermod -d $BASEDIR/informix informix
   ```

7. Reboot to verify that no database processes are running before you begin the install.

➡️ **Install using pkgadd:**

1. Log in as **root**.

2. Insert the ACSLS 6.1 CD-ROM.

3. In a terminal window or at the system prompt, enter

   `cd /cdrom/cdrom0/Solaris`

4. Install using pkgadd:

   `pkgadd -d .`

   Note: A space and a period must be entered after the command `pkgadd -d`.

   pkgadd asks what package you want installed.

5. When prompted to select a package, select STKacsls and press <return>.

6. Enter **y** or **n** at the prompt to install ACSLS in the default directory `/export/home/`.

   Use the default directory `/export/home` or enter the directory where you want ACSLS installed.

7. Type **y** to at the prompt to install setuid/setgid files.

8. Type **y** to at the prompt to install STKacsls.

   User and group IDs are created (unless they already exist). Files being installed are displayed.

   If the `acsss`, `acssa`, or `informix` user IDs are not defined with their home directories matching the ACSLS

---

installation directory, the installation script displays a warning, for example:

```
***WARNING*** User acsss already exists, but
its home directory does not match the ACSLS
installation directory.  Please change the
acsss home directory to /export/home/ACSSS
after the installation.
```

If the `acsss`, `acssa`, or `informix` user IDs are created during installation, a default password is not created. You need to go into the admintool to create a password.

9. Type **q** when prompted again to exit the pkgadd menu.

10. Type **cd /**

11. Eject the CD–ROM.

   eject cdrom

▷ **Apply any desired maintenance to ACSLS.**

This ensures that any maintenance is applied before ACSLS is installed.

▷ **Install ACSLS software:**

1. Change directories:

   cd /export/home/ACSSS/install

2. To initiate the installation shell script, enter

   ./install.sh

   If shared memory settings have ***not*** been defined, you are prompted to allow the script to set shared memory and reboot the server:

   `This server is not set with shared memory required for ACSLS and the Database.`

   `Set shared memory and reboot the server to take effect at kernel level? (y or n):`

   Respond **y** to the prompt.

   The server reboots.

   When the server comes back, log in as **root**, cd to /export/home/ACSSS/install (if you are not already in it), and restart install.sh.

3. Enter the database backup directory.

4. Respond **y** or **n** to the prompt for automatic startup on reboot.

Option: If you have a SCSI–attached Library continue with steps 5 and 6

5. Respond (y or n) to the prompt for installing a SCSI device driver for SCSI libraries.

   ```
   Do you want to install the scsi device driver
   for SCSI libraries? (y or n):
   ```

YES	The following message displays:
	`Enter the SCSI device(s) that correspond to each library. Separate devices with a space (example: 4 5 6). Remember that SCSI devices are numbers between 0 and 15.`
	Notes:
	• On most Solaris machines, target-7 is not a valid device address because target-7 is reserved for the SCSI initiator on the host-bus adapter.
	• If you are not sure what numbers to enter in this step follow the procedures in *Verifying the SCSI Library Connection* in "Appendix B: Troubleshooting"
	Continue with Step 6.

6. Respond (y or n) to the prompt after the specified SCSI device numbers display.

   ```
   Is this correct? (y or n):
   ```

7. The following message is displayed:

   ```
   install.sh 1501: You can enable/disable second
   disk support later as root by doing the UNIX
   command "cd /export/home/ACSSS/install;
   ./sd_mgr.sh".
   ```

   You can enable second disk support after you complete the procedures in this chapter. See the "Second Disk Support" in the Appendix.

8. Set the ACSLS user passwords.

    You need to set the following password to prevent a
    security exposure: `acsss, acssa, informix`, and `lib6.`

    You must set the passwords the first time you login to
    these IDs. To set the passwords:

    a. Login to each of the above user IDs.

    b. Enter the password at the prompt.

9. If the `acsss, acssa,` or `informix` user IDs were not
    defined with their home directories matching the ACSLS
    installation directory, and the installation script displayed a
    warning, modify these user IDs so that their home
    directories are under the ACSLS base directory.

    The following commands modify the above users' home
    directories. (You must be logged in as `root`.)

    ```
    usermod -d $BASEDIR/ACSSS acsss
    usermod -d $BASEDIR/ACSSA acssa
    usermod -d $BASEDIR/informix informix
    ```

Step 6: Import the database

In the following cases, you need to import the data from a
previous ACSLS release. They are:

*   If you are migrating from a previous release.

*   If you are re–installing ACSLS.

Refer to "Chapter 11: Database Backup and Restore," *Importing
the Database*.

Step 7: Configure your library hardware

Warning: If you imported data from a previous ACSLS release, you must start ACSLS and ensure all LSMs are online before configuring your library hardware. Then shut down ACSLS. This initializes the LSM types and protects your imported database information.

Note: You do not need to run acsss_config if you are not changing your library hardware. Go to step 8.

You must run acsss_config to configure you libraries if:

- this is a new installation,

- you are adding library hardware

Refer to "Chapter 7: Configuring your Library Hardware".

Step 8: Enter your License Key Information

You must enter a license key to activate ACSLS. To avoid unnecessary delays obtain your license key before you begin the ACSLS installation.

Refer to "Chapter 2: ACSLS License Key" for procedures.

Step 9: Reset any Custom Dynamic or Static Variables.

If you are migrating to ACSLS 6.1 from a previous release and have customized your dynamic or static variables, you need to reset them.

Refer to "Chapter 6: Verifying and Changing Your Static and Dynamic Variables" for procedures.

Step 10: Configure the Second Disk.

After installing and configuring ACSLS on the primry disk, configure the second disk as described in "Appendix A: Second Disk Support."

Step 11: Audit new libraries.

You need to audit your libraries:

- If this is a new installation.

- If you are adding new libraries to an existing configuration.

Step 12: Verify ACSLS Installation

Use the following procedure to mount or dismount a volume to verify ACSLS.

⇨ **Mount/dismount a volume to verify ACSLS:**

1. Verify you are logged in as `acsss`.

2. If ACSLS is not running, start it by entering

   `rc.acsss`

3. Query the server from the `cmd_proc` by entering

   `query server`

   If messages are displayed indicating that the server is in recovery mode, wait for a message indicating that the server is running.

4. Verify that the following are online. You must have at least one of each online. If not, bring them online with the `vary` command.

query port all

query acs all

query lsm all

query drive all

5. Do you have at least one volume in an LSM?

YES	Continue with the procedure.
NO	Enter a volume into an LSM.

6. Mount a volume by entering:

mount *vol_id drive_id*

Hint: Use the **q**uery **dr**ive command to get the ID of an available drive and the **q**uery **vo**lume command to get the ID of a library volume. See "Chapter 14: Command Reference."

7. Did you see a message indicating a successful mount?

A successful mount message is:

Mount: *vol_id* mounted on *drive_id*

YES	Procedure is complete.
NO	If an error message appears, run this verification procedure again, ensuring that you specified a valid, available drive and a library volume. If the mount/dismount still fails, call StorageTek for assistance.

8. Dismount the volume by entering:

dismount *vol_id drive_id* **force**

where *vol_id* is the volume and *drive_id* is the drive you specified in Step 6.

ACSLS Setup for Client Communication

To set up ACSLS for client communication, you include the client host name and IP address in /etc/hosts or in the NIS lookup table.

Regressing to a Previous Version of ACSLS

If you need to regress to a previous version of ACSLS after you install ACSLS 6.1, you need to perform the following steps:

- Export the database and save it on a tape or file external to the server.

- Uninstall ACSLS 6.1 as described in the steps below:

- Install the previous version of ACSLS

For assistance in regressing to a previous version, contact StorageTek Software Support. For more information, see *Requesting Help from Software Support*.

Uninstalling ACSLS 6.1

⇨   **To uninstall ACSLS 6.1:**

1. Log in as acsss.

2. Shut down ACSLS.
   kill.acsss

3. Shut down the Informix database:
   db_command stop
   db_command ism_stop

4. Remove pkgadd:

   ○ Log in as **root.**

   ○ Enter **pkgrm STKacsls**

5. Perform a file cleanup for the primary disk:

   ○ **cd /export/home**

      If you installed ACSLS in another directory other
      than /export/home, cd to that directory.

   ○ **rm -rf ACSSS informix**

   ○ cd **/export/backup**

      If you installed ACSLS backup in another directory
      other than /export/backup, cd to that directory.

   ○ **rm -rf informix misc server_to_server**

   ○ **cd /**

   ○ **rm -rf INFORMIXTMP nsr**

6. Perform a file cleanup for the second disk:

   ○ **cd /second_disk**

      If you installed the second disk in another directory
      other than /second_disk, cd to that directory.

   ○ **rm -rf data**

   ○ **cd /second_disk/backup**

      If you installed the second disk in another directory
      other than /second_disk/backup, cd to that directory.

   ○ **rm -rf informix misc**

7. If you want to reinstall ACSLS in a different ACSLS
   installation directory, either delete the acsss and informix

user id's or modify their home directories to be under the new ACSLS installation directory.

By default, the ACSLS installation directory is /export/home (referred to as $BASEDIR). The home directories for the ACSLS user IDs are:

- ○ acsss – **$BASEDIR/ACSSS**

- ○ informix – **$BASEDIR/informix**

8. Reboot.

Chapter 5. Installing ACSLS on AIX

ACSLS 6.1.1 supports AIX Version 4.3.3, Maintenance Level 9 and AIX Version 5.1. This chapter describes procedures for installing ACSLS on AIX Version 4.3.3, Maintenance Level 9 and AIX Version 5.1.

To apply any STK ACSLS maintenance, refer to the installation instructions in the associated PUT or SPE or PTF document included with the CD–ROM, or the document associated with the maintenance tar file on the StorageTek Customer Resource Center (CRC) web page.

The steps for installing ACSLS on AIX 4.3.3, Maintenance Level 9 and AIX Version 5.1 are:

1. Have your ACSLS license key information and ACSLS 6.1.1 CD–ROM available.

2. Backup and export the database and store it on a server separate from the one on which you are installing AIX 4.3.3 or AIX 5.1 if you are upgrading from a previous version of ACSLS (see *Exporting the Database* in "Chapter 10: Database Backup and Restore").

3. Prepare for AIX 4.3.3 or AIX 5.1 installation.

4. Install the AIX 4.3.3 or AIX 5.1 operating system; configure AIX using the SMIT fast path or the SMIT main menu.

5. Prepare for ACSLS installation.

6. Install ACSLS 6.1.1.

7. Import the database.

8. Configure your library hardware. (see "Chapter 6: Configuring your Library Hardware").

9. Enter your license key information (see "Chapter 2: "ACSLS License Key").

10. Reset any custom dynamic or static variables.

11. Audit new libraries.

12. Verify the ACSLS installation.

In addition, this chapter discusses:

- ACSLS Setup for Client Communications

- Regressing to a Previous Version of ACSLS

- Uninstalling ACSLS 6.1.1

Step 1: Backup and Export the Database

Backup and export the database and store it on a server separate from the one on which you are installing AIX 4.3.3 or AIX 5.1 if you are upgrading from a previous version of ACSLS (see *Exporting the Database* in "Chapter 10: Database Backup and Restore").

Step 2: Preparing for AIX Installation

Before installing AIX 4.3.3 or AIX 5.1, complete the following steps:

1. Have your license key information and ACSLS 6.1.1 CD–ROM available.

2. Satisfy all requirements specified in *Product Information* (see "ACSLS Online Information on the StorageTek CRC" in "About this Book") prior to installation of AIX or ACSLS.

3. Install the library hardware according to the StorageTek installation instructions.

    Caution: If you are installing a SCSI library, you *must* connect the server to the library before installing ACSLS.

4. Install the ACSLS server hardware according to the hardware manufacturer's instructions.

5. Ensure that the Standard Ethernet Network Interface is installed.

6. Determine and record information about network communication settings in the *Your System Values* column in **Table 5.** Pre–Installation Worksheet.

    Caution: Consult your system administrator for assistance in obtaining this information. It is critical that this information is correct in order for ACSLS to run properly.

Table 5.   Pre–Installation Worksheet

Installation Options	Valid Values	Your System Values
❏ Host Name		
❏ Internet Address		
❏ Network Mask		
❏ Gateway Address		

Step 3: Installing the AIX 4.3.3 or AIX 5.1 Operating System

Hint: While installing the AIX operating system, refer to Table 4. Pre-Installation Worksheet for the network communication settings you recorded during pre-installation preparation.

➡ **Install the AIX operating system according to the manufacturer's instructions.**

Note: Appendix D contains a procedure for installing the operating system from a system backup tape.

Caution: You must be running at least AIX 4.3.3 with maintenance level 9 installed or AIX 5.1. To determine the OS release, enter the command:

```
oslevel
```

Make sure that 4.3.3 or 5.1 appears in the output.

Hint: Installing AIX from a graphics terminal automatically installs the Common Desktop Environment (CDE).

Step 4: Configuring AIX

When you log in at the system prompt as **root**, you can configure AIX either through the SMIT fast path or through the SMIT main menu. StorageTek recommends configuring AIX for ACSLS through the SMIT fast path. The SMIT main menu can be used to enter special requirements or non-standard configurations.

Hint: When configuring your system, special characters appear in the SMIT screens. Items marked with an asterisk (*) must have information entered into the corresponding field. Items marked with a plus sign (+) indicate that there is a list of options available. To display this list, select the option and press ⟦F4⟧.

Enter your information while the left column item is highlighted. The information appears in the right column.

Using the SMIT Fast Path to Configure AIX

The SMIT fast path bypasses the main menu and takes you directly to the submenus required for configuring AIX. Table 6. provides a quick reference listing of fast path configuration changes and the commands that take you directly to the appropriate submenus.

Table 6. Configuration Checklist for SMIT Fast Path

Required Configuration Changes	SMIT Command
❏ Set date and time	`smitty date`
❏ Set time zone	`smitty chtz`
❏ Set up display devices	`smitty chcons`
❏ Configure TCP/IP	`smitty mktcpip`
❏ Set internet addresses for clients	`smitty mkhostent`
❏ Create file systems	`smitty crjfs`
❏ Mount file systems	`smitty mountfs`
❏ Change /var file system size	`smitty chjfs`
❏ Add ports	`smitty tty`
❏ Back up operating system	`smitty mksysb`
❏ Install ACSLS	`smitty install_all`

The following section describes the procedures contained in the submenus of the SMIT fast path for each of the SMIT Commands listed in Table 5, "Configuration Checklist for SMIT Fast Path."

Set Date and Time

1. Log in at the console prompt as **root**.

2. At the prompt enter

   smitty date

   You can now set the system date and time.

3. At the prompt enter

   smitty chtz

4. At the Use DAYLIGHT SAVING TIME prompt, enter **yes** or **no**.

   The CUT (Coordinated Universal Time) Time Zone screen appears.

5. Select your time zone from the list of time zones *and* press ⟦ENTER⟧.

6. Make any needed corrections to the date and time in the Change / Show Date, Time & Time Zone screen by moving the cursor to the desired field and typing in the information.

7. Press ⟦ENTER⟧ to run the command.

   The Command Status screen appears, and the system runs the command. The Command: OK message at the top of the screen should appear.

8. Did you change the date or time?

   Enter **yes** or **no** and press ⟦F10⟧ to return to the prompt.

Set Up Display Devices

1. At the prompt, enter

   smitty chcons

   The `Assign the Console` screen appears.

2. Keep the defaults for both `PATHNAME of Console` and `Enable for LOGIN`.

3. Press ⟦ENTER⟧ to run the command.

   The `Command Status` screen appears, and the system runs the command.

4. When the `Command: OK` message appears at the top of the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

Configure TCP/IP

1. At the prompt, enter

   `smitty mktcpip`

   The `Available Network Interfaces` box appears.

2. Enter the appropriate network interface.

   The `Minimum Configuration & Startup` screen appears.

3. Enter all information for the items listed in this screen, referring to **Table 5.**

   HOSTNAME
   Internet ADDRESS
   Network INTERFACE

   .
   .
   .

   START Now   (Change to **Yes**)

4. Press ⟦ENTER⟧ to run the command.

5. When the `Command: OK` message appears in the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

Configure Asynchronous I/O

1. At the prompt, enter

   smitty devices

   The Devices screen appears.

2. Select Asynchronous I/O.

   The Asynchronous I/O box appears.

3. Select Change/Show Characteristics of Asynchronous I/O.

   The Change/Show Characteristics of Asynchronous I/O box appears.

4. Select Maximum number of servers. If number is less than 6, enter 6.

5. Select Minimum number of servers. If number is less than 1, enter 1.

6. From this screen, select State to be configured at system restart.

   Press tab until:

   available

   shows in this field.

   Note: Keep the remaining fields as they are. Do not make changes to them.

7. Press ⟦ENTER⟧ to run the command.

8. When the Command: OK message appears in the Command Status screen, press ⟦F10⟧ to return to the prompt.

Set Internet Addresses for Clients

This configuration administers the clients, which are workstations that access the ACSLS server. The client Internet addresses must be determined by your system administrator.

1. At the prompt, enter

    smitty mkhostent

    The Add a Host Name screen appears.

2. Enter information into the following fields (refer to your information in **Table 5.**):

    INTERNET ADDRESS
    HOSTNAME

    (The ALIAS and COMMENT fields are optional.)

3. Press ⟦ENTER⟧ to run the command.

4. When the Command: OK message appears in the Command Status screen, press ⟦F10⟧ to return to the prompt.

Create /export/home File System

This procedure creates the /export/home directory. You *must* have this directory because the Informix database installs all its files there.

1. At the prompt, enter

   smitty crjfs

   The Add Journaled File System screen appears.

2. Select Add a Standard Journaled File System.

3. Press ⟦ENTER⟧.

   The Volume Group Name field appears.

4. Select rootvg.

5. In the SIZE of file system (in 512-byte blocks) field, enter 1200000. (minimum)

6. Enter the following information for the remaining fields:

MOUNT POINT	**/export/home**
Mount AUTOMATICALLY at system restart?	**yes**
PERMISSIONS	**read/write**
Mount OPTIONS	**[]**
Start Disk Accounting?	**no**
Fragment Size (bytes)	**4096**
Number of bytes per inode	**4096**
Allocation group size (Mbytes)	**8**

7. Press ⟦ENTER⟧ to run the command.

8. When the Command: OK message appears in the Command Status screen, press ⟦F10⟧ to return to the prompt.

Create /export/backup File System

1. At the prompt, enter

   smitty crjfs

   The `Add Journaled File System` screen appears.

2. Select `Add a Standard Journaled File System`.

3. Press 〚ENTER〛.

   The `Volume Group Name` field appears.

4. Select `rootvg`.

5. In the `SIZE of file system (in 512-byte blocks)` field, enter a value determined as follows:

   ○ If the library is a 9310 (5500 volumes) or smaller, enter **800000** (minumum).

   ○ Otherwise, multiply 400000 by the number of 9310s and enter the result. For example, if you have six 9310s, you multiply 6 x 400000 = 2400000.

   Note: If the /export/backup file system becomes full, use `smitty chjfs` to increase the size. Increase the size to account for your system's activity and your ACSLS backup retention period (if longer than eight days).

6. Enter the following information for the remaining fields:

MOUNT POINT	**/export/backup**
Mount AUTOMATICALLY at system restart?	**yes**
PERMISSIONS	**read/write**
Mount OPTIONS	**[]**
Start Disk Accounting?	**no**
Fragment Size (bytes)	**4096**
Number of bytes per inode	**4096**
Allocation Group Size (Mb)	**8**

7. Press ⟦ENTER⟧ to run the command.

8. When the `Command: OK` message appears in the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

Mount /export/home File System

1. At the prompt, enter

   smitty mountfs

   The Mount a File System screen appears.

2. For the FILE SYSTEM name field, press ⟦F4⟧ and select the item on the same line as /export/home. Press ⟦ENTER⟧.

3. The remaining fields should be filled in as follows:

DIRECTORY over which to mount	**/export/home**
TYPE of file system	**jfs**
FORCE the mount	**no**
REMOTE NODE containing the file system to mount	**[]**
Mount as a REMOVABLE file system?	**no**
Mount as a READ-ONLY system?	**no**
Disallow DEVICE access via this mount?	**no**
Disallow execution of SUID and sgid programs in this file system?	**no**

4. Press ⟦ENTER⟧ to run the command.

5. When the Command: OK message appears in the Command Status screen, press ⟦F10⟧ to return to the prompt.

Mount /export/backup File System

1. At the prompt, enter

   smitty mountfs

   The `Mount a File System` screen appears.

2. For the `FILE SYSTEM` name field, press ⟦F4⟧ and select the item on the same line as /export/backup. Press ⟦ENTER⟧.

3. The remaining fields should be filled in as follows:

DIRECTORY over which to mount	**/export/backup**
TYPE of file system	**jfs**
FORCE the mount	**no**
REMOTE NODE containing the file system to mount	**[]**
Mount as a REMOVABLE file system?	**no**
Mount as a READ-ONLY system?	**no**
Disallow DEVICE access via this mount?	**no**
Disallow execution of SUID and sgid programs in this file system?	**no**

4. Press ⟦ENTER⟧ to run the command.

5. When the `Command: OK` message appears in the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

Change /var File System Size

The /var partition contains the SNA files and temporary files.

1. At the prompt, enter

   smitty chjfs

   The File System Name screen appears.

2. Select /var and press ⟦ENTER⟧.

   The Change/Show Characteristics of a Journaled File System screen appears.

3. The fields in this screen should be filled in as follows:

File System name	**/var**
NEW mount point	**[/var]**
SIZE of file system (in 512-byte blocks)	**[40960]**
Mount GROUP	**[bootfs]**
Mount AUTOMATICALLY at system restart?	**yes**
PERMISSIONS	**read/write**
Mount OPTIONS	**[]**
Start Disk Accounting?	**no**
Fragment size (bytes)	**512**
Number of bytes per inode	**4096**
Compression algorithm	**no**
Large File Enabled?	**false**
Allocation Group Size (Mbytes)	**8**

4. Press ⟦ENTER⟧ to run the command.

5. When the Command: OK message appears in the Command Status screen, press ⟦F10⟧ to return to the prompt.

Modify Paging Space

For ACSLS-dedicated servers, ACSLS 6.1.1 requires a minimum of 256 MB paging space for high library activity (more than 100 mounts per hour) and 128 MB for low library activity (fewer than 100 mounts per hour).

1. At the prompt, enter

   `smitty lvm`

   The `Logical Volume Manager` screen appears.

2. Select `Paging Space`.

3. Select `Change/Show Characteristics of a Paging Space`.

4. Select `hd6`.

5. From this screen, select `NUMBER of additional logical partitions` to equal system requirements, as described above.

6. Press ⟦ENTER⟧ to run the command.

7. When the `Command: OK` message appears in the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

8. Verify the amount of paging space by entering from the command line:

   `lsps -a`

Add Ports

If you must add additional ports to your system, ports must be RS232 ports.

To add a port for a modem:

1. At the prompt, enter

   smitty tty

   The TTY screen appears.

2. Select Add a TTY and press ⟦ENTER⟧.

   The TTY Type box appears.

3. Select tty rs232 Asynchronous Terminal and press ⟦ENTER⟧.

   The Parent Adapter box appears.

4. Select sa0 Available 01-C0 Standard I/O Serial Port 1.

   The Add a TTY screen appears.

5. From this screen, select PORT number and enter s1.

6. For the remaining fields on this screen, either accept the defaults or fill in according to the modem manufacturer's specifications.

7. Press ⟦ENTER⟧ to run the command.

8. When the Command: OK message appears in the Command Status screen, press ⟦F10⟧ to return to the prompt.

To add a serial library port (for serial-connected libraries):

1. At the prompt, enter

   smitty tty

   The TTY screen appears.

2. Select `Add a TTY` and press ⟦ENTER⟧.

    The `TTY Type` box appears.

3. Select `tty rs232 Asynchronous Terminal` and press ⟦ENTER⟧.

    The `Parent Adapter` box appears.

4. Select `sa1 Available 01-DO Standard I/O Serial Port 2` and press ⟦ENTER⟧.

    The `Add a TTY` screen appears.

5. From this screen, select `PORT number`, enter s2 and press ⟦ENTER⟧.

    Note: Keep the remaining fields as they are. Do not make changes to them.

6. Press ⟦ENTER⟧ to run the command.

7. When the `Command: OK` message appears in the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

8. Record the information in Table 7. for a serial port configuration.

    This information is required when you install ACSLS.

9. Repeat the preceding procedure for all serial ports you are adding, setting the options individually until all ports are set.

Table 7.   Serial Port Configuration Records (2)

ACS #__0__ Port Configuration	Device Name
Number of tty connections to ACS #__0__:	
Device name – ACS #__0__, tty device #0:	/dev/tty__
Device name – ACS #__0__, tty device #1:	/dev/tty__

ACS #___1__ Port Configuration	Device Name
Number of tty connections to ACS #__1__:	
Device name – ACS #__1__, tty device #0:	/dev/tty__
Device name – ACS #__1__, tty device #1:	/dev/tty__

Backing Up the Operating System

The following procedure shows how to back up the changes you've made to the operating system.

1. At the prompt, enter

   `smitty mksysb`

   The `Backup the System` screen appears.

2. Insert a blank tape into the tape drive.

3. In the `Backup DEVICE or FILE` field, enter **/dev/rmt0**.

   Note: On some systems, the tape drive configuration has a different device designation.

4. At the `Backup the System` screen, enter **yes** in the `EXPAND /tmp` field.

5. Press ⟦ENTER⟧ to run the command.

6. Insert additional blank tapes as required by the system.

7. When the `Command: OK` message appears in the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

STOP **Warning:** Be sure to store your backup tape cartridges in a safe location outside the library.

Using the SMIT Main Menu to Configure AIX

The following procedure, configuring AIX using the SMIT main menu, is intended for special system requirements or non-standard configurations. If you have already used the smitty fast path method to configure AIX, you do not need to use this procedure.

1. Log in as **root**.

2. At the prompt, enter

   `smitty`

   The main SMIT menu opens, shown in Figure 10.

3. To enter your configuration information, select the desired item from the main menu and continue through the pertinent submenus.

4. When you are finished filling in information for each main menu item, press ⟦ENTER⟧ for SMIT to run the command for you.

   A `Command Status` screen appears indicating that SMIT is executing the command. At the end of the execution the `Command: OK` message appears, and the results show on the screen.

5. To return to the prompt and select another item from the main menu, press ⟦F10⟧ and repeat Steps 2-4 above.

```
                              System Management

        Move cursor to desired item and press Enter.

        Software Installation & Maintenance

        Software License Management

        Devices

        System Storage Management (Physical & Logical Storage)

        Security & Users

        Communications Applications and Services

        Print Spooling

        Problem Determination

        Performance & Resource Scheduling

        System Environments

        Processes & Subsystems

        Applications

        Using SMIT (information only)


        F1=Help          F2=Refresh     F3=Cancel    F8=image
        F9=Shell         F10=Exit        Enter=Do
```

Figure 10. Main SMIT Menu

Step 5: Preparing for ACSLS Installation

Warning: Because of AIX Package Manager restriction, ACSLS 6.1.1 will be installed in the `/export/home/ACSSS` and `/export/home/informix` directories.

Before you install ACSLS, complete the following steps:

1. Verify that the server system hardware is properly configured, connected, powered on and ready.

2. If your installation includes a 9300 or 4400 library and a single, serial LMU:

   a. Connect the serial LMU to serial port-1, reserving port-0 for a remote service modem.

   b. If a modem is not used, connect both serial ports to the serial LMU for redundant communications.

3. If your installation includes a 9300 or 4400 library and dual 9330 serial LMUs:

   a. Refer to RS/6000 hardware documentation for installation instructions of the serial expander card and attachment of the serial brick.

   b. Attach the adapter to the MCA bus or the PCI bus on the server.

   c. From the brick, run 4 cables, 2 to each serial LMU (see Figure 11)
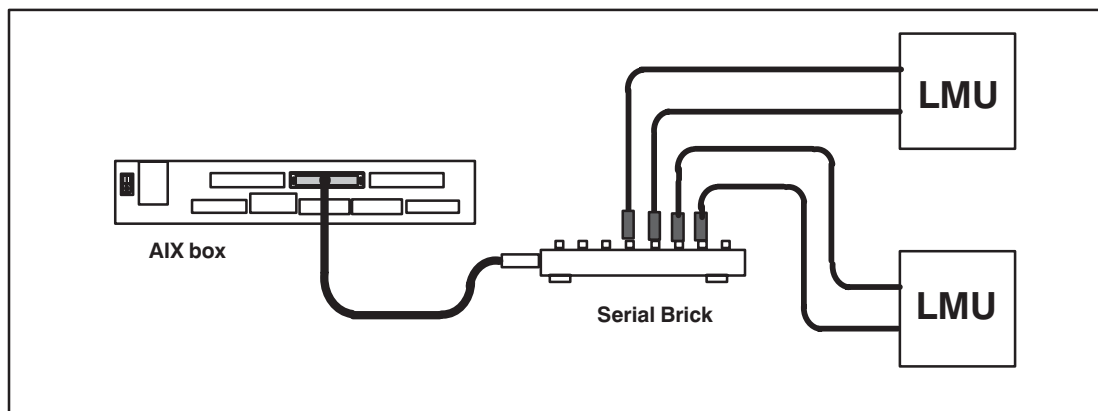
Figure 11. Dual Serial LMU Connection Configuration

4. If your installation includes a 9300 library and TCP/IP
    LMU(s), connect the TCP/IP LMU(s) to the network used
    for LMU communication.

5. If your installation includes a SCSI library and a
    single-ended SCSI interface, do the following:

    ○   Verify proper single–ended SCSI cable terminator
        attachment. Make sure that the cable does not exceed
        3 meters between the server and the SCSI library.

        Hint: The single-ended configuration allows the
        LSM to connect to the host system bus. Noises on
        the system bus can corrupt data bound for the system
        disk. Common sources of spurious noise should be
        avoided, including: hot plugging devices on the SCSI
        bus, attaching cables that are not actively terminated,
        and powering down an attached peripheral while
        UNIX is running.

    ○   Verify the proper SCSI target address. Consult the
        appropriate SCSI hardware operator's guide for
        setting this address on the LSM.

    ○   Set the SCSI library at SCSI target 0, target 2, or
        target 5. Typically, target 1 is reserved for a second
        disk, target 3 is reserved for a boot disk, target 4 is
        reserved for an external tape device, target 6 is
        reserved for a CD–ROM, and target 7 is reserved for
        a SCSI controller.

        Hint: If 1,3,4,6, or 7 are already reserved on your
        system, use 0,2, or 5 for your SCSI library.

6. If your installation includes a SCSI library and an
    embedded single–ended bus on the AIX platform, do the
    following:

    ○   Find which targets on your embedded single–ended
        bus are already populated, using the following
        command:

        `lsdev -C -s scsi`

```
$ lsdev -C -s scsi
cd0          Available 04-C0-00-3,0 SCSI Multimedia CD-ROM Drive
hdisk0       Available 04-C0-00-4,0 16 Bit SCSI Disk Drive
hdisk1       Available 04-C0-00-5,0 16 Bit SCSI Disk Drive
hdisk2       Available 04-C0-00-6,0 16 Bit SCSI Disk Drive
mchanger0    Available 04-05-00-6,0 Other SCSI Tape Drive
```

Figure 12. Example of populated targets on embedded single–ended bus

Hint: The above example shows output for two separate controllers, C0 and 05. Controller C0 is the single–ended embedded host–bus adapter. It controls four devices at targets 3, 4, 5, and 6 on that bus for a CD–ROM drive and three disk drives. The second controller, 05, has only one device attached, the mchanger device sitting at target 6 on the second bus. The AIX system assumes that the last device in the list is a tape drive; however it is actually a StorageTek library.

7. If your installation includes a SCSI library and a differential SCSI interface, do the following:

   ○ Verify proper SCSI cable and SCSI differential terminator attachment.

   ○ Make sure the cable does not exceed 25 meters.

8. If you intend to use removable media for database backup, have a blank cartridge available for your backup device.

9. ACSLS requires specific user IDs. If these user IDs are not defined before ACSLS installation, ACSLS creates them. When ACSLS installation creates the user IDs, the system assigns the user ID numbers and group ID numbers. To assign specific user ID and group ID numbers, you must define the following groups and users before installing ACSLS:

User	Group
acsss	staff
acssa	staff

lib6   staff
informix   informix

When these user IDs are defined before ACSLS installation, they can either be defined locally (on the ACSLS server) or via remote authentication methods (e.g., NIS or Kerberos). These user IDs must be defined with the following properties:

○ The shell for these user IDs must be ksh on AIX.

○ The home directories for the acsss, acssa, and informix user IDs must be under the ACSLS installation directory. The ACSLS installation directory is always /export/home on AIX. The home directories for the ACSLS user IDs are:

  acsss   **/export/home/ACSSS**
  acssa   **/export/home/ACSSA**
  informix **/export/home/informix**

If the home directories for the ACSLS user IDs do **not** match their required locations, please either modify the home directories for these users or delete the user IDs so they are added correctly during the ACSLS installation process.

The following command creates the acsss user on AIX. (You must be logged in as root.)

```
mkuser -a home=/export/home/ACSSS pgrp=staff gecos="ACSLS Control Login" acsss
```

The account information is:

```
acsss     home=/export/home/ACSSS      pgrp=staff gecos="ACSLS Control Login"
acssa     home=/export/home/ACSSA      pgrp=staff gecos="ACSLS SA Login"
informix  home=/export/home/informix/IDS7.3   pgrp=informix
                                       gecos="ACSLS Informix Database Owner"
lib6      home=/export/home/ACSSS      pgrp=staff
```

The following commands modify the acsss, acssa, and informix users' home directories. (You must be logged in as root.)

```
chuser -a home=/export/home/ACSSS acsss
chuser -a home=/export/home/ACSSA acssa
chuser -a home=/export/home/informix informix
```

Step 6: Installing ACSLS

⇨ **Verify Disk Space**

Before installing ACSLS, verify that the hard disk was
partitioned appropriately when the operating system was
installed and configured.

⇨ **Verify disk partitions**

1. At the system prompt enter **df -k** to verify the following:

   ○ The total KB space available is at least 580,000 for
     the /export/home file system for the database.
     /export/home will contain the contents of the
     installation media.

   ○ The total KB space available for /export/backup is
     at least 390,000 for the database backup.

⇨ **Install ACSLS:**

1. Is this a new installation?

YES	Go to Step 9.
NO	Make sure you exported the database.
	Complete Steps 2 through 8 below.
	Then continue with Step 9.

2. Log in as **acsss**.

3. Shut down ACSLS and the Informix database:

   idle (from a cmd_proc)
   kill.acsss (from a command prompt)

   If you are upgrading from ACSLS 6.0 or 6.0.1, enter the
   following commands:

   db_command stop

   db_command ism_stop

   crontab -r (removes crontab entries**)**

4. Log in as **root**.

5. If your previous installation of ACSLS is release 6.1 or greater, remove the ACSLS package using SMIT. Otherwise, skip to Step 6.

   ○ At the prompt, enter:

     smitty

     Press ⟦ENTER⟧

   ○ Move cursor to "Software Installation & Maintenance." Press ⟦ENTER⟧.

   ○ Move cursor to "Software Maintenance and Utilities" in the sub–menu. Press ⟦ENTER⟧.

   ○ Move cursor to "Remove Installed Sofware" and, when prompted, enter:

     acsls.rte

   ○ Use the "down" arrow to move to the Preview Only? line. Use the tab to select the "No" option.

   ○ Press ⟦ENTER⟧.

   ○ Press ⟦ENTER⟧.

   ○ Use the arrow key to scroll down to see whether the removal was successful, then Press ⟦F10⟧ to exit.

6. Login as root and remove ACSLS, backup and other files:

   For ACSLS 5.3 or 5.3.2, enter:

   ○ **cd /export/home**
   ○ **rm -rf ACSSS oracle**
   ○ **cd /export/backup**
   ○ **rm -rf oracle misc**

   For ACSLS 5.4, enter:

   ○ **cd /export/home**
   ○ **rm -rf ACSSS sybase**
   ○ **cd /export/backup**

  ○ **rm -rf sybase misc**

For ACSLS 6.0 or 6.0.1, enter:

  ○ **cd /export/home**

  ○ **rm -rf ACSSS informix**

  ○ **cd /export/backup**

  ○ **rm -rf informix misc**

   If the server_to_server directory exists, enter:

   rm -rf informix misc server_to_server

  ○ **cd /**

  ○ **rm -rf INFORMIXTMP nsr**

STOP

Warning: When removing files, especially in the root directory (/) be very careful to type commands **exactly, including spaces only where shown**.

7. Remove files under second disk (if installed)

  ○ **cd /second_disk**

   If you installed the second disk in another directory other than /second_disk, cd to that directory.

  ○ **rm -rf data**

  ○ **cd /second_disk/backup**

   If you installed the second disk in another directory other than /second_disk/backup, cd to that directory.

For ACSLS 5.3 or 5.3.2, enter:

  ○ **rm -rf oracle misc**

For ACSLS 5.4, enter:

  ○ **rm -rf sybase misc**

For ACSLS 6.0 or 6.0.1, enter:

  ○ **rm -rf informix misc**

8. Reboot to verify that no database processes are running before you begin the install.

reboot

9. Log in as **root**.

10. Insert the ACSLS CD–ROM into the drive.

Warning: Because of AIX Package Manager restriction, ACSLS
6.1.1 will be installed in the /export/home/ACSSS and
/export/home/informix directories.

11. Install theACSLS package using SMIT:

   ○ At the prompt, enter:

   smitty install_all

   ○ Highlight the "Imput device/directory for software"
      and enter:

   /dev/cd0

   as the input device and press ⟦ENTER⟧.

   ○ A new screen appears, asking for "SOFTWARE to
      install." Press ⟦F4⟧**.**

   ○ Use the "down" arrow to move to the "acsls.rte"line.
      To select it, Press ⟦F7⟧**.**

   ○ Press ⟦ENTER⟧.

   ○ Press ⟦ENTER⟧.

   ○ Press ⟦ENTER⟧.

   ○ Wait for the OK prompt at the top of the screen, then
      Press ⟦F10⟧ to exit**.**

Note: If the acsss, acssa, or informix user IDs are not
defined with their home directories matching the ACSLS
installation directory, the installation script displays a
warning, for example:

```
***WARNING*** User acsss already exists, but
its home directory does not match the ACSLS
installation directory.  Please change the
acsss home directory to /export/home/ACSSS
after the installation.
```

12. Apply any desired maintenance to ACSLS.

This ensures that any maintenance is applied before ACSLS is installed.

13. To perform the installation:

   ○ Change to the install directory. Enter:

   `cd /export/home/ACSSS/install`

   ○ Initiate the installation shell script by entering:

   `./install.sh`

   ○ Press ⟦ENTER⟧ to accept the default directory /export/backup when you are prompted for the directory to use for database backups.

   ○ Respond (y or n) to the prompt for automatic startup on reboot.

   ```
   Do you want your system configured so that
   when it reboots, it automatically restarts
   the ACSLS? (y or n):
   ```

Building the mchanger Driver (Steps 14 through 20)

14. Respond to the prompt for installing a SCSI device driver for SCSI libraries.

   ```
   Do you want to install the SCSI device
   driver for SCSI libraries? (y or n):
   ```

YES	Continue with Step 15.
NO	Go to Step 19.

15. Respond to the prompt for a SCSI adapter name.

   ```
   Enter the SCSI adapter name you want
   configured.  The valid adapter names are:
   ```

   The system displays SCSI adapter names.

16. At the prompt, type one of the SCSI adapter names displayed.

17. The screen will display a prompt similar to this example:

   ```
   Use SCSI adapter "scsi0"?
   ```

Respond (y or n) to the prompt.

18. ACSLS will display the prompt:

    ```
    Is this correct?
    ```

    Respond (y or n) to the prompt.

    The following message displays:

    ```
    Enter the SCSI device(s) that correspond to
    each library connected to SCSI bus
    <your-scsi-bus>.  Separate devices with a
    space (example: 4 5 6).  Remember that SCSI
    devices are numbers between 0 and 15.
    ```

    Note: L180 and L700 LSMs can reside at any target from
    0 to 15. 97*xx* LSMs will have a target address ranging
    from 0 to 6.

19. Enter a device number for each SCSI LSM.

    The display will show all SCSI device numbers specified.
    The system then asks

    ```
    Is this correct? (y or n):
    ```

    Respond (y or n) as appropriate.   The system displays a
    message similar to:

    ```
    mchanger0 Available
    ```

    Hint: If the status of the device is not shown as
    "Available," refer to *Troubleshooting Library Connections*
    in "Appendix B: Troubleshooting."

    Respond (y or n) to the prompt to configure additional
    SCSI libraries.

    ```
    Do you want to configure additional SCSI
    libraries? (y or n):
    ```

    Note: If you install more than one library, the device
    numbers are displayed consecutively, starting with 0.

20. Remember to record the device name to use in configuring
    ACSLS.

21. Eject the CD-ROM by pressing the eject button.

22. Remove and store the ACSLS 6.1.1 CD-ROM.

23. Set the ACSLS user passwords.

   You need to set the passwords for the following user IDs to prevent a security exposure: `acsss`, `acssa`, `informix`, and `lib6.`

   To do this when installing ACSLS for the first time:

   a. Login as **root**.

   b. Enter the password at the prompt.

   c. Login as the user ID.

   d. Enter the password at the prompt.

24. If the `acsss`, `acssa`, or `informix` user IDs were not defined with their home directories matching the ACSLS installation directory, and the installation script displayed a warning, modify these user IDs so that their home directories are under the ACSLS base directory.

   The following commands modify the `acsss`, `acssa`, and `informix` users' home directories. (You must be logged in as `root`.)

   ```
   chuser -a home=/export/home/ACSSS acsss
   chuser -a home=/export/home/ACSSA acssa
   chuser -a home=/export/home/informix informix
   ```

Step 7: Import the Database

If you are:

- upgrading from a previous release of ACSLS, or

- re–installing ACSLS 6.1.1

you need to import the data from the previous installation. Refer to "Chapter 11: Database Backup and Restore."

Step 8: Configure your Library Hardware

Warning: If you imported data from a previous ACSLS release, you must start ACSLS and ensure all LSMs are online before configuring your library hardware. Then shut down ACSLS. This initializes the LSM types and protects your imported database information.

Note: You do not need to run acsss_config if you are not changing your library hardware. Go to step 9.

You must run acsss_config to configure your libraries if:

- this is a new installation, or

- you are adding library hardware.

Refer to "Chapter 7: Configuring your Library Hardware."

Step 9: Enter your License Key Information

You must enter a license key to activate ACSLS. To avoid unnecessary delays, obtain your license key before you begin the ACSLS installation. Refer to "Chapter 2: ACSLS License Key."

Step 10: Reset any Custom Dynamic or Static Variables

If you are upgrading to ACSLS 6.1.1 from a previous release and if you have customized your dynamic or static variables, you need to reset them. Refer to "Chapter 6: Verifying and Changing your Static and Dynamic Variables."

Step 11: Configure the Second Disk

After installing and configuring ACSLS on the primary disk, configure the second disk as described in Appendix A. "Second Disk Support."

Step 12: Audit New Libraries

You need to audit your libraries:

- if this is a new installation, or

- if you are upgrading from an earlier release of ACSLS and you are adding new libraries.

Step 13: Verify ACSLS Installation

Use the following procedure to mount or dismount a volume to verify ACSLS.

➭ **Mount/dismount a volume to verify ACSLS:**

1. Verify you are logged in as `acsss`.

2. If ACSLS is not running, start it by entering

   rc.acsss

3. Query the server from the cmd_proc by entering

   query server

   If messages are displayed indicating that the server is in recovery mode, wait for a message indicating that the server is running.

4. Verify that the following are online. You must have at least one of each online. If not, bring them online with the vary command.

   query port all

   query acs all

   query lsm all

   query drive all

5. Do you have at least one volume in an LSM?

YES	Continue with the procedure.
NO	Enter a volume into an LSM.

6. Mount a volume by entering:

mount *vol_id drive_id*

Hint: Use the **q**uery **dr**ive command to get the ID of an available drive and the **q**uery **vo**lume command to get the ID of a library volume. See "Command Reference" chapter.

7. Did you see a message indicating a successful mount?

A successful mount message is:

Mount: *vol_id* mounted on *drive_id*

YES	Procedure is complete.
NO	If an error message appears, run this verification procedure again, ensuring that you specified a valid, available drive and a library volume. If the mount/dismount still fails, call StorageTek for assistance.

8. Dismount the volume by entering:

dismount *vol_id drive_id* **force**

where *vol_id* is the volume and *drive_id* is the drive you specified in Step 6.

ACSLS Setup for Client Communication

To set up ACSLS for client communication, you include the client host name and IP address in /etc/hosts or in the NIS lookup table.

Regressing to a Previous Version of ACSLS

If you need to regress to a previous version of ACSLS after you install ACSLS 6.1.1, you need to perform the following steps:

- Export the database and save it on a tape or file external to the server.

- Uninstall ACSLS 6.1.1 as described in the steps below:

- Install the previous version of ACSLS

For assistance in regressing to a previous version, contact StorageTek Software Support. For more information, see *Requesting Help from Software Support*.

Uninstalling ACSLS 6.1.1

⇨   **To uninstall ACSLS 6.1.1:**

1. Log in as acsss.

2. Shut down ACSLS.

   kill.acsss

3. Shut down the Informix database:

   db_command stop

   db_command ism_stop

4. Remove ACSLS 6.1.1 using the Package Manager:

   ○ Log in as **root.**

   ○ Enter the `System Management Interface Tool` (SMIT):

      smit

      This brings up the `System Managment` menu.

   ○ Select `Software Installation and Maintenance.`

   ○ Select `Software Maintenance and Utilities.`

   ○ Select `Remove Installed Software.`

   ○ Enter the `SOFTWARE` name:

      acsls.rte

   ○ Set `PREVIEW only? (remove operation will NOT occur)` to [**no**]

   ○ Press ⟦ENTER⟧.

   ○ Press ⟦ENTER⟧ again to confirm.

      A series of messages showing the progress of the removal of ACSLS 6.1.1 will appear.

5. Perform a file cleanup:

   ○ **cd /export/home**

   ○ **rm -rf ACSSS informix**

   ○ cd **/export/backup**

   ○ **rm -rf informix misc server_to_server**

   ○ **cd /**

   ○ **rm -rf INFORMIXTMP nsr**

6. Perform a file cleanup for the second disk:

   ○ **cd /second_disk**

○ `rm -rf data`

○ `cd /second_disk/backup`

○ `rm -rf informix misc`

7. Reboot.

Chapter 6. Verifying and Changing Dynamic and Static Variables

Use the options described in this chapter any time you need to verify or change the static or dynamic variables.

Follow these steps:

1. Access the ACSLS features configuration menu.

2. Change your dynamic and static variables (options 1–7) on the ACSLS features configuration menu.

   If you are changing only one variable within a group, press 〚ENTER〛 to accept the new value, then press 〚CTRL〛 + D. To accept the defaults for the remaining items, complete the group, and return to the main menu.

3. **Reboot** your system if you have set any static variable(s). You do not have to do this for the dynamic variables.

4. Optionally display dynamic, static, or both options by typing:

   - ○ dv_print
     displays values of dynamic options.

   - ○ dv_config
     provides you with the valid choices.

   - ○ dv_config -d
     dumps all variables.

You can view, change, and save the current variables by entering:

1. Display the current settings of the variables by entering:

   dv_config -d

2. Save the current settings of the variables to a file by entering:

   dv_config -d > *filename*

3. View the file by entering:

   vi *filename*

   The file lists the current settings for each variable name.

Step 1: Accessing the ACSLS features configuration menu

1. Exit out of the CDE until you reach the CDE login.

2. Log in as acsss.

3. At the password prompt, press [[ENTER]].

4. To run the configuration script, enter

   acsss_config

   The ACSLS feature configuration screen appears.

   Note: The configuration script, acsss_config, will fail unless all LMUs, LSMs, and transports are fully configured, powered on, and ready.

The following menu appears:

>   **ACSLS feature configuration**

```
Please enter the number followed by Return for your
choice from the following menu to configure product
behavior in that area.
```

```
Press ? followed by the Return key for help.
```

- 1: Set CSI tuning variables

- 2: Set event logging variables

- 3: Set general product behavior variables

- 4: Set access control variables

- 5: Set automatic backup parameters

- 6: Rebuild access control information

- 7: Event Notification settings

- 8: Define or Change Library Hardware
       Configuration

- E: Exit

```
Menu choice:
```

Step 2: Verifying or Changing Dynamic and Static Variables (options 1–7)

When you install or upgrade ACSLS, system defaults have already been set based on most user environments. However, when necessary, you can use options 1–8 to change any of these settings. Options 1 through 7 are discussed in this chapter.

Use option 8 to add and define your library hardware. Use this option if you have just installed ACSLS for the first time, or, for example, when you need to add a new library. Option 8 is discussed in Chapter 7: Configuring your Library Hardware.

Option 1 – Set CSI tuning variables

The Client System Interface (CSI) handles communication between ACSLS and clients of other servers. It sets up how communications are handled for each client. If communication with one client is lost, the other clients are not affected and their communication continues without interruption. Multiple CSIs can run under ACSLS.

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This option allows you to set or change the following:

- **Prompt:** *Maximum age in seconds of pending requests in CSI request queue [172800]*

  Variable: CSI_CONNECT_AGETIME

  A dynamic variable, this setting determines how long ACSLS holds on to client requests to which it has not responded.

  Valid entry is: 600 to 315360000 seconds. Default is 172800 seconds.

- **Prompt:** *Number of seconds between successive retries [4].*

  Variable: CSI_RETRY_TIMEOUT

  The default is 4 seconds.

  A dynamic variable, this option specifies the minimum amount of time, in seconds, that the CSI should wait between attempts to establish a network connection.

  You should modify this value if timing problems occur between the CSC and CSI.

- **Prompt:** *Number of retries for the CSI before a timeout condition occurs [5].*

  Variable: CSI_RETRY_TRIES

  A dynamic variable, this option specifies the number of attempts the CSI should make to transmit a message. Pending messages are discarded if a connection cannot be established within the number of retries specified. Default is 5 retries.

- **Prompt:** *Changes to alter use of the TCP protocol will not take effect until the product is restarted. CSI support for RPC using the TCP protocol is enabled [TRUE].*

  Variable: CSI_TCP-RPCSERVICE

A static option, this option specifies if the CSI is to act as a TCP RPC server. Default is true.

- **Prompt:** *Changes to alter the use of the UDP protocol will not take effect until the product is restarted. CSI support for RPC using the UDP protocol is enabled [TRUE].*

  Variable: `CSI_UDP_RPCSERVICE`

  A static option, this option specifies if the CSI is to act as a UDP RPC server. Default is true.

- **Prompt:** *Changes to alter use of the port mapper will not take effect until the product is restarted. Enable port mapper: (ALWAYS / NEVER /IF_DUAL_LAN_NOT_ENABLED) [IF_DUAL_LAN_NOT_ENABLED]*.

  Variable: `CSI_USE_PORTMAPPER`

  Default is IF_DUAL_LAN_NOT_ENABLED. A static option, the valid options are:

  - ALWAYS – the port mapper should always be interrogated when the CSI is unable to send a message to a client.

  - NEVER – the port mapper should never be interrogated when the CSI is unable to send a message to a client. Select this option if clients do not support a port mapper.

  - IF_DUAL_LAN_NOT_ENABLED – the port mapper should be interrogated only if dual LAN support has not been enabled. If dual LAN support has been enabled, then it is assumed that clients do not support a port mapper.

- **Prompt:** *Number of ACSSURR persistent processes that should be started [1]*:

  Variable: `SURROGATE_PROCESSES`

Chapter 6. Verifying and Changing Dynamic and Static Variables **141**

This variable applies only to the Library Management (LM) Gateway. The ACSLS surrogate process (ACSSURR) listens on a TCP/IP socked for ACS requests. These requests are typically sent from a gateway system that sits behind a network firewall. This option allows you to specify how many surrogate processes should be started when ACSLS starts.

Valid entries are 0 or 1. Enter a 0 if the LM Gateway is not installed.

- **Prompt:** *TCP/IP port number that the ACSLS surrogate (ACSSURR) socked will listen on for requests from a gateway system [50300].*

  Variable: SURROGATE_PORT

  This variable applies only to the Library Management (LM) Gateway. Valid entry: 50300– 99999.

- **Prompt:** *Number of seconds to wait for data packets to be read on surrogate/gateway socket?*:

  Variable: SURROGATE_TIMEOUT

  This variable applies only to the Library Management (LM) Gateway. Valid entry: 1–600.

- **Prompt:** *Number of minutes to wait before deleting a stale queue entry [5]:*

  Variable: SURROGATE_QUEUE_AGE

  This variable applies only to the Library Management (LM) Gateway.

  Valid entry: 1–600.

Option 2 – Set event logging variables

This option allows you to set or change the following event logs:

- **Prompt:** *Number of event log files to retain [9]*:

  Variable: EVENT_FILE_NUMBER

9 is the default when ACSLS is installed or upgraded.

A dynamic value, this option allows you to specify the number of additional event log files to retain. If enabled and the current event log file size reaches the threshold size, the log is automatically copied to another file. Once the specified number of files is reached, the data in the oldest file is overlaid.

If you specify 0, ACSLS creates only one event log file with no additional event log files. When this file reaches its threshold size, an "Event log full" message is displayed periodically until the event log is renamed or deleted.

Specify a number between 1 and 9 to enable and specify the number of log files to retain. When the event log reaches the threshold size , the data is moved into the file `event0.log`. The next time the threshold size is reached, the `event0.log` data is moved to `event1.log` and the older event log data is moved to `event0.log` .

- **Prompt:** *Changes to the logging directory will not take effect until the product is restarted. What directory should logging information be in [$ACS_HOME/log]:*

  Variable: `LOG_PATH`

  This is the directory where the log files are to be placed. By default the ACSLS log files are placed in the $ACS_HOME/log directory. An alternative path can be used if there are disk space problems in the file system that contains $ACS_HOME.

  The path must be an absolute path, that is, it must start with a / or $ACS_HOME.

  Path length cannot exceed 120 alpha characters.

- **Prompt:** *Maximum library server event log size in Kbytes (1000 bytes) [500].*

Variable: `LOG_SIZE`

This option specifies the threshold size for the Event Log in Kbytes (1000 bytes). Default is 500.

Valid entry: 32–2147483

- **Prompt:** *Date/time format for all logs [%Y–%m–%d %H:%M:%S]*:

Variable: `TIME_FORMAT`

This option specifies the format to use for printing the date and time information in the event and trace logs. The default format is %Y–%m–%d %H:%M:%S.

Note: This format does not apply to the backup dates presented for a point–in–time restore.

Press ? to get detailed information.

Option 3 – Set general product behavior variables

This option allows you to set or change the following:

- **Prompt:** *Enable Library Volume Statistics Gathering: (ON / OFF) [OFF]: ?*

Variable: `LIB_VOL_STATS`

This option specifies if the Library Volume Statistics (LVSTATS) information should be collected from the following operations: enter; eject; mount; dismount; and audit. Logging these statistics can take considerable disk space. Default is OFF.

- **Prompt:** *Number of acsss_stats log files to retain [9]:*

Variable: `VOL_STATS_FILE_NUM`

A dynamic value, this option allows you to specify file size and number of rollover files for the volume statistics log (acsss_stats.log). Valid entry: 0–9. Default is 9.

9 is the default when ACSLS is installed or upgraded.

A dynamic value, this option allows you to specify the number of additional `acsss_stats` log files to retain. If enabled and the current `acsss_stats` log file size reaches the threshold size, the log is automatically copied to another file. Once the specified number of files is reached, the data in the oldest file is overlaid.

If you specify 0, ACSLS creates only one event log file with no additional event log files. When this file reaches its threshold size, an "`acsss_stats` log full" message is displayed periodically until the `acsss_stats` log is renamed or deleted.

Specify a number between 1 and 9 to enable and specify the number of log files to retain. When the `acsss_stats` log reaches the threshold size, the data is moved to the file `vol_stats0.log`. The next time the threshold size is reached, the `vol_stats0.log` data is moved to `vol_stats1.log` and the older event log data is moved to `vol_stats0.log` .

- **Prompt:** *Maximum library server access_stats log size in Kbytes (1000 bytes) [500].*

  Variable: `VOL_STATS_FILE_SIZE`

  This option specifies the threshold size for the `accss_stats` log in Kbytes (1000 bytes). Default is 500.

  Valid entry: 32–2147483

- **Prompt:** *Select cleaning cartridge ordering method [VOLID_SORT]*

  Variable: `UNIFORM_CLEAN_USE`

  Valid selections are:

  - ○ VOLID_SORT – orders the cleaning cartridges by the volume identifier . This uses up a cleaning cartridge before moving to the next one. If you select this option, ACSLS uses and returns cleaning cartridges in the same order as in previous releases of

Chapter 6. Verifying and Changing Dynamic and Static Variables **145**

the ACSLS software. This is the default value when ACSLS is installed or updated.

- ○ LEAST_USED – orders the cleaning cartridges by usage. If you select this option, ACSLS sorts the volume list in reverse order of usage and returns the cartridges with the fewest usages first. This spreads out usage of cleaning cartridges uniformly.

- ○ MOST_CAPACITY – orders the cleaning cartridges by number of uses left. If you select this option, ACSLS sorts the volume list based on the number of uses left on the cleaning cartridge and returns the cartridges with the most uses left first. This uses up all cleaning cartridges close to the same time.

- **Prompt:** *Enable Transport Auto Clean Option (TRUE/FALSE) [TRUE]:*

  Variable: `AUTO_CLEAN`

  Valid selections are:

  - ○ TRUE – when a transport requires cleaning, ACSLS automatically cleans the transport before the next mount.

    Note: You cannot enable auto–cleaning for drives attached to SCSI–attached LSMs. ACSLS only allows you to clean these drives by manually mounting a cleaning cartridge. Use the LSM control panel to enable auto–cleaning.

  - ○ FALSE – does not enable automatic cleaning

- **Prompt:** *Library Server startup state (RUN/IDLE) [RUN]:*

Variable: AUTO_START

This option specifies the initial ACSLS state after recovery completes during server software initiation.

Valid selections are:

- ○ RUN – user requests are processed immediately after recovery completes.

- ○ IDLE – prevents user requests from being immediately processed after recovery completes.

  Setting this option to IDLE could be useful if you need to vary device states or perform some operational activity before you allow server access to your users.

- **Prompt:** *Changes to the number of mount processes ACSLS supports will not take effect until the product is restarted. Number of mount processes [2]: ?*

Variable: MAX_ACSMT

Valid entry is 1 to 5.

StorageTek recommends that you accept the default value at initial configuration, then change the value as required. Increasing this value may improve performance.

- **Prompt:** *Enable QUERY persistent processes (TRUE/FALSE) [TRUE]: ?*

Variable: ENABLE_ACSQY

This options allows you to execute queries as one or more persistent processes.

StorageTek recommends that you accept the default value at initial configuration, then change the value as required. Increasing this value may improve performance.

Valid selections are:

- ○ TRUE – enables persistent query processes.

  Warning: With a minimum configuration system, higher than 10 query persistent processes could use up system resources and not allow ACSLS to start up.

- ○ FALSE – disables persistent query processes. Queries are invoked as request processes.

- **Prompt:** *Changes to the number of query processes ACSLS supports will not take effect until the product is restarted. Number of processes processes [2]: ?*

Variable: MAX_ACSQY

This option specifies the number of persistent query processes to create, only if you enabled it in the above step. Valid numbers are 1 to 5.

StorageTek recommends that you accept the default value at initial configuration, then change the value as required. For large configurations (more than eight LSMs), this value may need to be increased to improve performance.

Warning: If this number is set too high, ACSLS may not be able to start up properly. Either lower the number or increase the maximum allowable process per user.

- **Prompt:** *Changes to the maximum number of ACSLS processes will not take effect until the product is restarted. Number of ACSLS processes [40]: ?*

Variable: MAX_ACS_PROCESSES

Valid numbers are: 32 to 10000.

A transient process is used to satisfy all requests except: mount; dismount; lock; unlock; clear_lock; and query_lock. The default, 40 processes, works for all ACSLS processes except extremely large configurations.

STOP

Warning: It is recommended you contact Software Support for advice before changing this value.

- **Prompt:** *Enable automatic enter tracing facility (TRUE/FALSE) [FALSE]:*

Variable: TRACE_ENTER

This option specifies if the results of automatic enter operations are written in the event log.

Valid selections are:

- ○ TRUE – enables messages to be written to the event log at the end of each automatic enter operation. This is the only method for determining why volumes were not entered during an automatic enter operation.

- ○ FALSE – disables this feature and helps minimize the number of messages written to the event log.

- *Enable volume tracing facility (TRUE/FALSE) [FALSE]:*

Variable: TRACE_VOLUME

This option specifies if unsolicited messages are displayed when adding/deleting a volume(s) in the database.

Valid selections are:

- ○ TRUE – enables unsolicited messages to be displayed whenever a volume is added or deleted in the database.   Operations that can generate this

---

Chapter 6. Verifying and Changing Dynamic and Static Variables **149**

messages are: audit; mount; dismount; enter; eject; recover; and vary.

- ○ FALSE – disables this feature and helps minimize the number of messages written to the event log.

- **Prompt:** *Database isolation level. See Help for explanation of levels. [1]: ?*

  Variable: ISOLATION_LEVEL

  The isolation level is used to define the degree of concurrency among processes that attempt to access the same rows simultaneously in Informix Database. The database isolation level affects read concurrency when rows are retrieved from the database as in queries and volume reports. The database server uses shared locks to support different levels of isolation among processes attempting to access data. The update or delete process always acquires an exclusive lock on the row that is being modified. The level of isolation does not interfere with rows that are being updated or deleted. If another process attempts to update or delete rows that are being read with an isolation level of Repeatable Read, that process is denied access to those rows.

  You can choose from four isolation level options.

  - ○ **0 – Dirty Read**
    Provides zero isolation. Dirty Read is appropriate for static tables that are used for queries. With a Dirty Read isolation level, a query might return a *phantom* row, which is an uncommitted row that was inserted or modified within a transaction that has subsequently rolled back. No other isolation level allows access to a phantom row. Dirty Read is the only isolation level available to databases that do not have transactions.

  - ○ **1 – Committed Read (default isolation level)**
    Guarantees that every retrieved row is committed in the table at the time that the row is retrieved. Even so, no locks are acquired. After one process retrieves

a row because no lock is held on the row, another process can acquire an exclusive lock on the same row and modify or delete data in the row. Committed Read is the default level of isolation in a database with logging that is not ANSI compliant.

- ○ **2 – Cursor Stability**
  Acquires a shared lock on the selected row. Another process can also acquire a shared lock on the same row, but no process can acquire an exclusive lock to modify data in the row. When you fetch another row or close the cursor, the database server releases the shared lock. If you set the isolation level to Cursor Stability, but you are not using a transaction, the Cursor Stability isolation level acts like the Committed Read isolation level. Locks are acquired when the isolation level is set to Cursor Stability outside a transaction, but they are released immediately at the end of the statement that reads the row.

- ○ **3 – Repeatable Read**
  Acquires a shared lock on every row that is selected during the transaction. Another process can also acquire a shared lock on a selected row, but no other process can modify any selected row during your transaction or insert a row that meets the search criteria of your query during your transaction. If you repeat the query during the transaction, you reread the same information. The shared locks are released only when the transaction commits or rolls back. Repeatable Read is the default isolation level in an ANSI–compliant database.

- **Prompt:** *Number of days to retain volumes that are identified as ABSENT or EJECTED in the database. [5]:*

  Variable: `ABSENT_VOLUME_RETENTION_PERIOD`

  A dynamic variable, it sets the number of days (0–999) to keep absent or ejected volumes in the database. Unless you reenter the volume, ACSLS automatically deletes the

volume from the database when the retention period expires.

If you never want the volume to be deleted, enter 999. To delete the volume immediately, enter 0.

STOP

Warning: Setting a high retention period can cause a large number of absent or ejected volumes to be retained. This uses more space in the database and causes it to fill up faster.

- **Prompt:** *Report ABSENT or EJECTED volumes to ACSAPI clients. [FALSE]:*

  Variable: ENABLE_STATUS_VOLUME_ABSENT

  Valid selections are:

    ○ TRUE – reports absent and ejected volumes to ACSAPI clients.

    ○ FALSE – absent and ejected volumes are not reported to ACSAPI clients (as occurred in previous versions of ACSLS).

- **Prompt:** *Status of MISSING volumes reported to ACSAPI clients: TRUE=MISSING. FALSE=IN TRANSIT [FALSE]:*

  Variable: ENABLE_STATUS_VOLUME_MISSING

  This option sets the status code to be returned to ACSAPI clients for missing volumes.

    ○ TRUE – reports missing volumes to ACSAPI clients.

    ○ FALSE – missing volumes are not reported to ACSAPI clients (as occurred in previous versions of ACSLS).

Option 4 – Set access control variables

This option allows you to set or change the following access control variables:

- **Prompt:** *Changes to command access control will not take effect until the product is restarted. Access control is active for commands. (TRUE/FALSE) [FALSE].*

  Variable: AC_CMD_ACCESS

  Specifies if access control is active for commands. This allows control over which ACSLS command each network client is allowed to execute.

  The default, false, disables access control.

- **Prompt:** *Default access for commands (ACCESS/NOACCESS) [ACCESS].*

  Variable: AC_CMD_DEFAULT

  Specifies the default access to commands if there is no relevant access control lists.

  The default, ACCESS, allows command access unless otherwise denied through configuration information provided in the access control files.

- **Prompt:** *Changes to volume access control will not take effect until the product is restarted. Access control is active for volumes. (TRUE/FALSE) [FALSE].*

  Variable: AC_VOL_ACCESS

  Specifies if access control is active for volumes. This allows control over which ACSLS clients can access specific volumes. You must restart ACSLS for this option to take effect.

  The default, false, disables access control for volumes.

- **Prompt:** *Default access for volumes (ACCESS/NOACCESS) [ACCESS].*

Variable: AC_VOL_DEFAULT

Specifies the default access to volumes if there is no relevant access control lists.

The default, NOACCESS, disallows volume access unless otherwise granted through configuration information provided in the access control files.

- **Prompt:** *Messages will be logged when access to commands or volumes is denied (TRUE/FALSE) [FALSE].*

  Variable: AC_LOG_ACCESS

  Specifies if a message is logged in the event log when access to a command or volume is denied. The command or volume id is logged, as well as the access id and host id if this option is enabled.

Option 5 – Set automatic backup variables

This option allows you to set or change the following automatic backup variables:

- **Prompt:** *Would you like to modify the automatic backup settings? (y or n)*

  Variable: None. The automatic backup settings are saved in crontab. Please use acsss_config to modify these settings.

  Valid selections are:

  ○ Y – If yes, you are asked if you want to back up everyday. If "yes", then you must enter the time in HH:MM format.

    If no, you must select the day(s) of the week to back up. Then you must enter the time in HH:MM format.

  ○ N – you go to the next question regarding the ISM server retention period.

- **Prompt:** *Set the retention period of all data that ISM server tracks. See Help for explanation. [8].*

Variable: RETENTION_PERIOD

The option sets how many days the ISM server tracks the data on your storage volumes before the volume is designate as not eligible for reuse. Valid number of days: 4–30

The retention period is the period of time for which you retain backups. Transaction log files are *retained* with each backup, increasing the space needed in the backup partition. When choosing a retention period, consider the following conditions specific to your site:

- ○ The size and activity of your library

- ○ The number of automatic and manual backups performed in a given period of time

    Notes:

    When you run a manual backup with the bdb.acsss utility, an automatic backup to local disk is also done, thereby increasing the number of backups in the backup partition.

    The retention period should be greater than the interval between backups. For example, if you have a retention period of four days, you should take automated or manual backups at least three times a week, with no more than three days between backups.

- ○ The period of time for which you would like to retain backups and transaction log files, keeping in mind that long retention periods increase the space needed in the backup partition.

- ○ The size of your backup partition

Option 6 – Rebuild Access Control information

This option rebuilds your access control tables, if access control is alive and/or has been changed.

Option 7 – Event Notification Settings

- **Prompt:** *Set the number of event messages sent to a client between two successive client checks by ACSLS. [100]*

  Variable: CLIENT_CHECK_MESSAGE_COUNT

  This option specifies the number of event notification messages to send a client and the minimum check interval (set with next question) before ACSLS checks to verify the registered client is still alive.

  Valid entry: 10 – 1000 messages

- **Prompt:** *Enter the minimum interval between two successive client checks by ACSLS (in minutes). [30]*

  Variable: CLIENT_CHECK_MIN_INTERVAL

  ACSLS checks periodically if a registered client is still alive. This check is performed when the minimum interval and the event notification message count is exceeded.

  Valid entry: 1 – 600 minutes

- **Prompt:** *Enter the time a client has to respond to a client check with a check registration request (in seconds) [30]:*

  Variable: CLIENT_CHECK_RESPONSE_TIME

  When ACSLS checks periodically if a registered client is still alive, the client must respond with a check registration request within the specified response time. If the client does not respond within this time period, the client's Event Notification registration is cancelled.

  Valid entry: 5 – 300 seconds

- **Prompt:** *Enter the polling interval for confirming Event Notification client registration (in minutes) [60]:*

  Variable: CLIENT_CHECK_POLLING_INTERVAL

  ACSLS checks periodically if a registered client is still alive. At the polling interval specified, ACSLS sends a

client check response to all clients who have not issued register, unregister, or check registration requests within this polling interval.

Valid entry: 10 – 1440 minutes

Step 3: Reboot your system if you have set any static variable(s).

You do not have to do this for the dynamic variables.

Chapter 7. Configuring Your Library Hardware

Use this procedure to configure your library hardware if you are a first time user, or to add a new library.

The ACSLS database must be updated whenever the physical configuration of the library changes. ACSLS will not run if the configuration defined in its database does not match the configuration defined in the LMU.

Examples of configuration changes requiring an update to the database include:

- Adding or removing an ACS, LSM (including a SCSI-attached LSM such as the 9710), Pass-Thru Port (PTP), transport, or standby LMU

Caution: After you install a new ACS or LSM, make sure that each attached LMU and LSM is fully (hardware) configured, powered on, and ready before you reconfigure ACSLS. Otherwise, the `acsss_config` script will fail.

- Changing the "master/slave" relationship between two LSMs

- Adding or removing a port connection between the server system and the LMU

Note: Tape drives can be added and removed with the config drives utility. See *config drives* in "Chapter 13 , Utility Reference."

Note: Drive types and drive serial numbers are automatically updated when LSMs and/or drives are varied online. They are also updated by the `config drives` utility.

Use the Build/Verify Library Configuration routine to update the database with all configuration changes *except* adding or removing port connections. Use the Configure Library Communications routine to reconfigure ports. Use both routines if you have added or removed an ACS. Both of these routines warn you that existing configuration data will be overwritten.

In most cases, you should perform an audit after using the Build/Verify Library Configuration routine to reconfigure the library.

Defining or Changing your Library Configuration

⇨   **To configure library hardware:**

1. Login as `acsss`.

2. Idle ACSLS from the `cmd_proc` and shut down ACSLS.

   kill.acsss

   Note: If subsequent system messages indicate that the PID file does not exist, this means that ACSLS was not running.

   You are still in `acsss.`

3. Type:

   acsss_config

The following menu appears:

ACSLS feature configuration

Please enter the number followed by Return for your
choice from the following menu to configure product
behavior in that area.

Press ? followed by the Return key for help.

- 1: Set CSI tuning variables

- 2: Set event logging variables

- 3: Set general product behavior variables

- 4: Set access control variables

- 5: Set automatic backup parameters

- 6: Rebuild access control information

- 7: Event Notification settings

- 8: Define or Change Library Hardware
      Configuration

- E: Exit

Menu choice:

> **Note:** The configuration script, `acsss_config`, will fail
> unless all LMUs, LSMs, and transports are fully
> configured, powered on, and ready.

4. Select option 8.

   The script displays progress messages during database
   creation. This takes about five minutes.

5. Enter **y** at the following prompt:

   Configure library communications? (y/n):

6. Have you previously configured the system?

YES	Enter **y** at the following prompt: `Library server database exists and will be overwritten, continue? (y or n):` Continue with Step 6.
NO	Continue with Step 9.

7. Enter the number of ACSs that will be supported at your site.

   `Number of ACSs to be supported:`

   You must answer at least **1** to this prompt. Hardware must be installed to support one or more ACSs.

8. Enter the number of connections to your ACS.

   `Number of connections to ACS #n`

   Note: A pair of L700e SCSI libraries connected by a pass–thru–port has two connections – one for each L700e.

9. Enter the device or host for each connection. (See Table 3, "Library Configuration Options.")

   `Device or host – ACS#n, connection #n:`

   ┌─ **Sample serial device names for 4400 or 9300 libraries** ─────┐

   `Device or host – ACS #0, device #0: `**`/dev/ttya`**
   `Device or host – ACS #0, device #1: `**`/dev/ttyb`**

   └──┘

   To specify the connection to a TCP/IP attached LMU, enter one of the following:

   ○ An IP address

   ○ A hostname

   ○ A fully qualified hostname

   Note: If a hostname is specified, this hostname must be mapped to the IP address entered into the 9330 LMU. This hostname-to-IP address mapping is site-specific. Typically,

this is done by the /etc/hosts file, your Domain Name
Server, NIS, or NIS+

Sample TCP/IP device names for 9300 libraries

```
Device or host — ACS #0, connection #0: hostname1
Device or host — ACS #0, connection #1: hostname2
Device or host — ACS #1, connection #0: fully.qualified.hostname
Device or host — ACS #2, connection #0: 192.168.174.31
```

Note: A connection to a 9330 ACS can be either serial or
TCP/IP, but not both.

Sample device name for SCSI library

```
Device or host — ACS #1, connection #0: /dev/mchanger2
```

Sample device names for pair of L700es

```
Device or host — ACS #1, connection #0: /dev/mchanger2
Device or host — ACS #1, connection #1: /dev/mchanger3
```

Note: For Solaris only: On a Solaris system, the device
name is assigned during ACSLS installation when the
SCSI device number is entered.

10. Enter **y** at the following prompt to build/verify the library
configuration.

```
This step builds a database image of your
complete library hardware configuration.
Before proceeding, make sure that your
library is completely configured, that all
subsystems are functional and powered on.
Build/Verify library configuration?
(y or n):
```

11. Have you previously configured the system?

YES	Enter **y** at the following prompt:
	`Library server database exists and will be overwritten, continue? (y or n):`
	As the script builds the library configuration, it displays the following message for each panel in each LSM.
	`ACS # n, LSM # nn, PANEL # nn, created`
	The script also generates a library configuration report and appends it to the following file:
	`/export/home/ACSSS/log/acsss_config.log`
NO	Continue with Step 12.

12. Respond (**y** or **n**) when the system asks whether to configure client system interfaces.

Enter "n" unless you are using an ICL client with OSLAN protocol.

> `Configure client system interfaces?`
> `(y or n):`

YES	The following message displays:
	`        CSI SELECTION TABLE`
	`1)  OSLAN CSI        Not Selected`
	`2)  ONC/RPC CSI      Always Selected`
	`Do you want to change the CSI selection table (n):`
	If **y**, the following message appears:
	`Select OSLAN CSI (n):`
	ONC/RPC is always selected.
NO	Continue with Step 13.

13. Enter **y** to the following question: `Are you backing up the database to tape?` if you want to backup the database to tape.

Hint: At this point in the reconfiguration, StorageTek recommends that you back up the database to a tape that

---

can be stored offsite and used, if needed, for disaster
recovery of the database.

YES	Do you want to backup the database to tape? (y or n)
	Enter **y** and insert a blank tape when the following message appears.
	Prepare for database backup..
	Insert database backup tape
	Press RETURN to confinue.
	The database backup procedure bdb.acsss automatically executes and captures the configuration data to enable database journaling.
	When the database backup is completed, the following message displays:
	Database backup successfully completed.
	Continue with Step 14.
NO	If you do not want to back up the database to tape. Enter n. You return to the main acsss_config menu.
	Continue with Step 15.

Caution: The tape drive may appear idle during the
backup. It may not make any sounds or flash any lights
during this time. **DO NOT** remove the tape from the drive
until you see the following success message indicating the
backup is complete:

Database backup successfully completed.

STOP **Warning:** Interrupting the backup process before
completion will result in corruption of the database.

14. Remove the tape and store it in a safe place.

15. Enter **E** to exit from the main acsss_config menu.

16. Enter your license key if:

- this is a new installation.

- you are upgrading to a new ACSLS release.

- you have increased the number of storage cells in your existing configuration in excess of your current licensed capacity.

17. Run `rc.acsss` to start the server.

If the `automatic startup on reboot` option was enabled during ACSLS installation, ACSLS is initiated automatically when the server system is rebooted.

ACSLS is now ready for library operations. If you want to enter ACSLS commands, log in as **acssa**.

18. Perform an audit of the Library

An audit updates the ACSLS database to match the actual inventory of library volumes.

Chapter 8. Access Control

ACSLS access control allows you to selectively limit client access to commands and/or volumes.

- Command access control allows you to restrict use of commands (for example, <u>mount</u> or <u>eject</u>) for all volumes.

- Volume access control allows you to logically partition an ACS and restrict command access to specified volumes or volume ranges.

Note: The System Administrator using cmd_proc *always* has access to all commands.

How ACSLS Access Control Works

Once set up and enabled, ACSLS access control uses a set of client identification files and a series of allow and/or disallow files that you create to manage command and/or volume access. Then, when ACSLS receives a request, it does the following:

- Verifies whether the client that made the request is in one of the client identification files.

- If the requesting client *didn't* pass a user_ID field in the request packet, ACSLS attempts to match the requestor's IP address with those in the internet.addresses table. If a match is found, ACSLS updates the user_ID field in the request packet with the user_ID in the internet.addresses record for that IP address.

- If the requesting client *did* pass in a user_ID field in the request packet, ACSLS attempts to match both the IP address and the user_ID with those in the `internet.addresses` table.

- If the input internet address/user_ID pair doesn't match any entries in the internet.addresses table, a NULL string will be substituted for the user_ID when validated against the allow and disallow permission tables. This ensures that users not in the `internet.addresses` table will be managed by the system access control user defaults and removes any possibility of an unauthorized user gaining access to or control of another user's data.

- Checks the allow and/or disallow files to determine if the user is authorized to issue the command against a volume. If the user is authorized, ACSLS accepts the command. If the user is not authorized, ACSLS rejects the command.

➩ To set up ACSLS access control, perform the following tasks:

1. Create a client-identification file for the corresponding network protocol the client systems will use:

   ○ `internet.addresses` file for TCP/IP protocol networks

   ○ `adi.names` file for OSLAN protocol networks

   ○ `lu62.names` file for SNA protocol networks (available only for AIX platform for ACSLS)

   Note: Use `vi` or another text program to create the access control files described here. Samples of these files, which you can copy, rename, and modify, reside in the `$ACS_HOME/data/external/access_control` directory.

2. Create the command `allow` and/or `disallow` files, if command access control is required.

3. Create the user `allow` and/or `disallow` files and set the volume ownership of volumes, if volume access control is required.

4. If access control is already enabled, simply select Option 6 from the `acsss.config` menu to rebuild the access control tables.

   Note: It is not necessary to restart ACSLS to rebuild the tables using Option 6.

5. Enable ACSLS access control and restart ACSLS, so that it can build the access control files. (See "Enabling ACSLS Access Control" below.

These tasks are discussed in detail in the following sections.

Creating an
`internet.addresses`
File for TCP/IP
Protocol Clients

To implement ACSLS access control, you must create a client-identification file in the `$ACS_HOME/data/external/access_control` directory. For clients using TCP/IP protocol, you create an `internet.addresses` file.

Each line in the `internet.addresses` file consists of two fields. The first is the internet address of the client computer. The second is a user_ID to identify the client computer. This user_ID is not necessarily the system logon. It is determined by the client system.

The following example shows a sample `internet.addresses` file. In this sample file, both `cray` and `test_group` are user_IDs for the client computer whose Internet address is `65.102.32.56`.

```
# Filename: internet.addresses
#
#  This file contains the internet addresses of all hosts for which we will
#  use the associated name as the user_ID.
#
#  First string=Internet address. Second string is name to place in user_ID field
#  For example,
#  1.1.1.1    louisville
#
#  Last modified: 02/05/13   Veda Prescott.  Added 87.10.3.87
#
#  Internet addr       user_ID        Comments

10.28.32.754          stlouis        The DEC machine in St Louis
65.102.32.56          cray           The Cray downstairs
65.102.32.56          test_group     Test partition for Cray
87.10.3.87            customer1      Outside customer host
```

Figure 13. Example of an `internet.addresses` *file*

Creating an adi.names File for OSLAN Protocol Networks

To implement ACSLS access control, you must create a client-identification file in the $ACS_HOME/data/external/access_control directory. For clients using OSLAN protocol, you create the adi.names file.

Each line in the adi.names file consists of two fields. The first is the OSLAN host name of the client computer. The second is a user_ID to identify the client computer. This user_ID is not the system logon.

The following example shows a sample `adi.names` file. In this sample file, `unisys` is the user_ID for the client computer whose OSLAN name is `SystemA`.

```
# Filename: adi.names
#
#  This file contains a list of ADI names for which you want to have the ACSLS
#  software automatically fill in the User ID (also known as the Access ID) in
#  the message header.
#  Each line should consist of the client host name and an associated name
#  separated by spaces or tabs. Note that both names may be the same.
#
#  Neither the host name or the associated name may have embedded tabs or spaces.
#  Anything to the right of the second name is treated as a comment.
#  Blank lines, and lines starting with # are ignored.
#
#  REVISION HISTORY:
#   XX/XX/XX NAME                DESCRIPTION OF CHANGE.
#
##########################################################################
# Client       user_ID        Comments

  SystemA       unisys         Unisys mainframe
  SystemB       seattle        Unisys server located in Seattle

```

Figure 14. Example of an `adi.names` *file*

Creating an lu62.names File for SNA Protocol Clients

To implement ACSLS access control, you must create a client-identification file in the `$ACS_HOME/data/external/access_control` directory. For clients using SNA protocol, you create the `lu62.names` file.

Note: The SNA protocol is only available for the AIX platform of ACSLS. The Solaris platform of ACSLS does not support SNA network protocol.

Each line in the `lu62.names` file consists of two fields. The first is the SNA host name of the client computer. This host name uses the "SNA_domain_name.Control_Point" naming convention for SNA clients. The second is a user_ID to identify the client computer. This user_ID is not the system logon.

The following example shows a sample `lu62.names` file. In this sample file, as400 is the user_ID for the client computer whose SNA name is SYSPLEX.PROD.

```
# Filename: adi.names
#
#  This file contains a list of SNA names for which you want to have the ACSLS
#  software automatically fill in the User ID (also known as the Access ID) in
#  the message header.
#  Each line should consist of the client host name and an associated name
#  separated by spaces or tabs. Note that both names may be the same.
#
#  Client host name uses the "SNA_domain_name. Control_Point" naming
#  convention for SNA clients.
#
#  Neither the host name or the associated name may have embedded tabs or spaces.
#  Anything to the right of the second name is treated as a comment.
#  Blank lines, and lines starting with # are ignored.
#
#  REVISION HISTORY:
#   XX/XX/XX NAME              DESCRIPTION OF CHANGE.
#
##############################################################################
# Client               user_ID          Comments

  SYSPLEX.PROD         as400            AS400 server
  Dev.TEST2            mvs              OS/390 server
```

Figure 15. Example of an `lu62.names` file

Creating Command Allow and/or Disallow Files

Command access control allows you to identify which clients should or should not have access to specified commands. ACSLS controls access to commands by means of `allow` and/or `disallow` files that you create in the `$ACS_HOME/data/external/access_control` directory.

- Create a `command.ALL.allow` file to identify users who are allowed to access all commands

- Create a `command.ALL.disallow` file to identify users who are not allowed access to any commands

- Create a command.*COMMAND*.allow file (e.g., command.*START*.allow) to identify users who are allowed to access the specified command

- Create a command.*COMMAND*.disallow file (e.g., command.*MOUNT*.disallow) to identify users who are not allowed to access the specified command.

You can use combinations of these files to tightly control access to commands. Refer to the Access Control scenarios on page 184 for examples of how combinations of files enable better ACSLS access control.

Notes:

Command allow and disallow files are mutually exclusive. If both allow and disallow files exist for a given command, ACSLS references the allow file and disregards the disallow file. If neither allow nor disallow files exist, ACSLS uses the dynamic variables AC_CMD_DEFAULT and AC_VOL_DEFAULT to control command and volume access. For more information, see *Reconfiguring ACSLS* in "Chapter 6, Verifying and Changing Dynamic and Static Variables."

The component of the file name that specifies the command, such as "MOUNT", "START" or "ALL" must be in upper case.

Figure 16 shows an example `command.ALL.allow` file that allows client 1 access to all commands.

```
#       Filename: command.ALL.allow
#
#       This file contains the user_IDs of all clients
#       with access to all commands.
#
#       Last modified: 92/08/25  Bill Johnson  File created
# user_ID     Comments
client_1      Payroll
```

Figure 16. Sample `command.ALL.allow` ***file***

Note: When creating `allow` and/or `disallow` files, any text following the user_ID (in this example, Payroll) is interpreted as a comment. Also, blank or empty user_IDs are not allowed; nor are user_IDs with leading, trailing, or embedded spaces.

A `command.ALL.disallow` file should have the same format as the `command.ALL.allow`.

Figure 17 shows an example `command.START.allow` file that restricts access to the `start` command so that only a single client (user_ID=stlouis) can start ACSLS.

```
#       Filename: command.START.allow
#
#       This file contains the user_IDs of all clients allowed to
#       perform the START command.
#
#       Last modified: 92/08/25   Bill Johnson.  Added acct-ibm
# user_ID     Comments
stlouis       The DEC machine in St. Louis
```

Figure 17. Sample `command.START.allow` ***file***

A `command.`*COMMAND*`.disallow` file should have the same format as the `command.`*COMMAND*`.allow`, but with the appropriate name (in this example, `command.START.disallow`).

Command access control can apply to the following commands:

Table 8.   Commands to which Command access control applies

audit	delete_pool	eject	mount[2]	set_clean	vary
cancel	dismount	enter[1]	query	set_scratch	
clear_lock	dismount_force	idle	query_lock	start	
define_pool	display	lock	set_cap	unlock	
1. Checking will also be done for virtual enter and continuous enter, but not for automatic enter. 2. Checking will also be done for mount scratch and mount read only.						

Use Table 9. as a quick reference for determining when command access is allowed. In the *Situation* column, `COMMAND` is the name of the command requested (for example, AUDIT).

Table 9.   Command Access Quick Reference

Situation	Access Allowed	Access Denied
The user is the System Administrator	X	
The user_ID is listed in `command.COMMAND.allow`	X	
The user_ID is listed in `command.ALL.allow`	X	
Either `command.COMMAND.allow`, `command.ALL.allow`, or both exist, and the user_ID is not listed in either file		X
Neither `command.COMMAND.allow` nor `command.ALL.allow` exist and the user_ID is listed in `command.COMMAND.disallow`		X
Neither `command.COMMAND.allow` nor `command.ALL.allow` exist and the user_ID is listed in `command.ALL.disallow`		X
Neither `command.COMMAND.allow` nor `command.ALL.allow` exist and the user_ID is not listed in either `command.COMMAND.disallow` or `command.ALL.disallow`	X	

Table 9. *Command Access Quick Reference*

Situation	Access Allowed	Access Denied
None of the following files exist: 　　　command.*COMMAND*.allow　　　command.ALL.allow 　　　command.*COMMAND*.disallow　　command.ALL.disallow and the AC_CMD_DEFAULT variable is set to ACCESS	X	
None of the following files exist: 　　　command.*COMMAND*.allow　　　command.ALL.allow 　　　command.*COMMAND*.disallow　　command.ALL.disallow and the AC_CMD_DEFAULT variable is set to NO ACCESS		X

Creating Users Allow and/or Disallow Files

The foundation of volume access control is that each volume is either owned or unowned as identified in the ACSLS `ownership.assignments` file. Usually, clients can access only unowned volumes and volumes that they own; however, using volume access control, volume owners can allow or deny other clients access to their volumes.

Again, ACSLS controls access to volumes by means of `allow` and/or `disallow` files that you create in the `$ACS_HOME/data/external/access_control` directory.

- Create a `users.ALL.allow` file to identify users who are allowed to access owned volumes to perform all commands.

- Create a `users.ALL.disallow` file to identify users who are not allowed to access owned volumes to perform any commands.

- Create a `users.COMMAND.allow` file to identify users who are allowed to access owned volumes for the specified command.

- Create a `users.COMMAND.disallow` file to identify users who are not allowed to access owned volumes for the specified command.

You can use combinations of these files to tightly control command access to volumes. Refer to the scenarios on page 184 for examples of how combinations of files enable ACSLS access control.

When ACSLS checks command access for a volume, it first compares the owner_ID with the client user_ID. If these IDs are the same, then the client is granted access. If these IDs are not the same, then ACSLS looks for relevant `allow` and/or `disallow` files. If it finds the client's user_ID in one of these files, it grants or denies command access accordingly.

Figure 18 shows a sample `users.ALL.allow` file. The first word on each uncommented line identifies a volume owner, by owner_ID. This owner_ID is followed by the user_ ID of those clients who can access the specified owner's volumes.

Note: When creating `allow` and/or `disallow` files, blank or empty owner_IDs are not allowed; nor are owner_IDs or user_IDs with leading, trailing, or embedded spaces.

```
#   Filename: users.ALL.allow
#
#   This file contains the user_IDs of those clients having access to all
#   volumes owned by the specified clients.
#
#   Last modified: 92/08/25 Bill Johnson File created
#
client_1        client_5
client_2        client_5
client_3        client_5
client_4        client_5
```

Figure 18. Sample `users.ALL.allow` ***file***

A `users.ALL.disallow` file uses the same format as the `users.ALL.allow`.

Figure 19 shows a sample `users.EJECT.allow` file for the `eject` command.

```
#   Filename: users.EJECT.allow
#
#   This file contains owner_IDs and the user_IDs of clients
#   which may eject the owner's volumes.  Lines are of the form:
#   owner-id    user-id1        user-id2              user-id3 ...
#   For example:
#   cray stlouis denver
#
#   Last modified: 92/08/25   Bill Johnson.  Added cray/stlouis combination
#   owner-id    user-id1        user-id2              user-id3        user-id4
#
cray            acct-ibm        stlouis               denver
convex          cray            dec                   stlouis         acct-ibm
```

Figure 19. Sample `users.EJECT.allow` ***file***

A `users.`*`COMMAND`*`.disallow` file uses the same format as the `users.`*`COMMAND`*`.allow`.

Volume access control applies to the following commands:

Table 10. Commands to which volume access control applies

dismount	lock	mount_readonly	set_clean	unlock
eject	mount	query_volume	event_notification	mount scratch
query scratch	query mount *	display	set_scratch	

Use Table 11. as a quick reference for determining when volume access is allowed. In the *Situation* column, *COMMAND* is the name of the command requested (for example, AUDIT).

Table 11. Volume Access Quick Reference

Situation	Access Allowed	Access Denied
The specified volume is unowned	X	
The user is the owner of the volume	X	
The user is the System Administrator	X	
The owner/user is listed in users.*COMMAND*.allow	X	
The owner/user is listed in users.ALL.allow	X	
If users.*COMMAND*.allow and/or users.ALL.allow exist, and the owner/user combination doesn't exist in either file		X
Neither users.*COMMAND*.allow nor users.ALL.allow exist and the owner/user is listed in users.*COMMAND*.disallow		X
Neither users.*COMMAND*.allow nor users.ALL.allow exist and the owner/user is listed in users.ALL.disallow		X
Neither users.*COMMAND*.allow nor users.ALL.allow exist, and users.*COMMAND*.disallow and/or users.ALL.disallow exist but the owner/user is not listed in either file	X	

None of the following files exist:
        users.*COMMAND*.allow   users.ALL.allow
        users.*COMMAND*.disallow   users.ALL.disallow
and the AC_VOL_DEFAULT variable is set to ACCESS
	X	

None of the following files exist:
        users.*COMMAND*.allow   users.ALL.allow
        users.*COMMAND*.disallow   users.ALL.disallow
and the AC_VOL_DEFAULT variable is set to NO ACCESS
		X

Setting Volume Ownership

You can set volume ownership in one of two ways:

- Via the <u>set</u> <u>owner</u> command on page 482

- Via the commands listed in Table 12. that create new volume records in the database.

Table 12. Commands for Setting Volume Ownership

Command	Volumes Affected
enter	Volumes entered using the enter command
enter automatic	Volumes entered without an explicit command via a CAP whose *cap_mode* is automatic
mount scratch	Mounting a scratch volume by issuing the mount scratch command or a regular mount command on a volume that is a scratch volume
set scratch	Setting a volume to become a scratch volume
set scratch reset	Resetting a scratch volume to become a data volume

The default ownership of volumes created when the commands in Table 12. are issued is defined in the ownership.assignments file. Figure 20 shows the sample ACSLS ownership.assignments file that resides in /home/ACSSS/data/access_control.

```
#  Owner_Default  =  Default owner - name is specified in line starting with
#  OWNER_DEFAULT.  If this line does not exist, volume is unowned.
#  requestor  =  user_ID in request
#  same       = Same owner - don't change
#  unowned    = Volume is unowned
#
OWNER_DEFAULT SYSTEM
#
#  The following commands have one keyword associated with them.
#  The keyword Requestor is invalid for ENTER_AUTOMATIC.
#
ENTER unowned
ENTER_AUTOMATIC unowned
#
#  The following commands have two keywords.  The first applies to owned
#  volumes,
#  and the second applies to unowned volumes.  The keyword Owner_default
#  invalid
#  for MOUNT_SCRATCH.
#
MOUNT_SCRATCH same unowned
SET_SCRATCH same unowned
SET_SCRATCH_RESET same unowned
```

Figure 20. Sample `ownership.assignments` **File**

Note: In the sample file in Figure 20, lines starting with # are comment lines; blank lines are ignored.

Data in an `ownership.assignments` file are pairs or triplets of words separated by spaces or tabs, and come in three forms: special pairs of words, pairs of words, and triplets of words.

- Special pairs of words assign a default owner for all unassigned volumes. The first word in the pair is `OWNER_DEFAULT`; the second word in the pair is the keyword that identifies the default owner.

  In Figure 20, the following data line is an example of a *special pair of words*:

      `OWNER_DEFAULT SYSTEM`

  In this example, `SYSTEM` is the default owner.

- Pairs of words are associated with new volumes. New volumes can be entered using the <u>en</u>ter and <u>en</u>ter

automatic commands. The first word in the pair is the name of the command; the second word in the pair is the keyword that assigns ownership of the volume.

In Figure 20, the following data line is an example of a *pair of words* form:

        ENTER Unowned

- Triplets of words are found with commands (mount scratch, set scratch, and set scratch reset) that can be applied to existing volumes (either owned or unowned). The first word in the triplet is the name of the command; the second word is the keyword that assigns ownership of *owned* volumes; the third is the keyword that assigns ownership of *unowned* volumes.

    In Figure 20, the following data line is an example of a *triplet of words* form:

        MOUNT_SCRATCH Same Unowned

Table 13. summarizes, for each of the commands that can set volume ownership, the number of ownership keywords accepted, valid keywords, and default keywords.

Table 13. Commands and Valid Ownership Keywords

Command	Number of Allowed Keywords (Valid Keywords)	Default Keyword
enter[2]	1 (same, owner_default, requestor[1], unowned)	unowned
enter automatic[2]	1 (same, owner_default, unowned)	unowned
mount scratch	2 (same, requestor[1], unowned)	same (owned volumes), unowned (unowned volumes)
set scratch	2 (same, owner_default, requestor[1], unowned)	same (owned volumes), unowned (unowned volumes)
set scratch reset	2 (same, owner_default, requestor[1], unowned)	same (owned volumes), unowned (unowned volumes)
1. If the keyword requestor is specified and the user_ID contains a null string, the volume is unowned. 2. For commands that create new volume entries, the keyword same results in volumes being unowned.		

Note: Keywords in an `ownership.assignments` file are case-independent and can be abbreviated. Valid abbreviations include `S`, `Own`, `REQ`, `Un`. Also, you may use dashes in place of the underscores in this file.

Access Control Logging

The dynamic variable `AC_LOG_ACESS` specifies whether a message is logged in the event log when access to a command or a volume is denied. For more information, see "Chapter 6, Verifying and Changing Dynamic and Static Variables".

Enabling ACSLS Access Control

ACSLS access control is disabled by default. Enable it by setting static variables using `acsss_config` Option 4. Then, stop and restart ACSLS.

- To enable command access control, set the static variable `AC_CMD_ACCESS` to TRUE. (This variable defaults to FALSE if this variable is not set or has a value other than TRUE,).

- To enable volume access control, set the static variable `AC_VOL_ACCESS` to TRUE. (This variable defaults to FALSE if this variable is not set or has a value other than TRUE.).

For more information see "Chapter 6, Verifying and Changing Dynamic and Static Variables".

Access Control Scenarios

Use the following scenarios to understand how access control can fit your needs. Note, these scenarios were based upon the following assumptions:

- You allowed ACSLS to fill in the user_id field, which means access to commands and volumes is restricted on a client computer basis.

- Your configuration features a single ACS, and you have five clients that talk to the ACS. Entries in your internet.addresses file look like the following:

```
# Filename:   internet.addresses
123.45.9.65    client_1
52.22.61.5     client_2
76.24.52.1     client_3
14.117.82.74   client_4
104.77.23.32   client_5
```

Figure 21. Sample internet.addresses *file*

- For command access control scenarios, you've set up default access to commands using the AC_CMD_DEFAULT dynamic variable. Possible values are ACCESS and NOACCESS. The variable defaults to ACCESS.

  ○ If you want most clients to have access to most commands, set AC_CMD_DEFAULT to ACCESS.

  ○ If you do not want most clients to have access to most commands, set AC_CMD_DEFAULT to NOACCESS.

- For volume access control scenarios, you've set up default access to volumes using the AC_VOL_DEFAULT dynamic variable. Possible values are ACCESS and NOACCESS. The variable defaults to NOACCESS.

  ○ If, in general, you want to restrict volume access to the owner of a volume, set AC_VOL_DEFAULT to NOACCESS (the default).

   ○ If you want most clients to have access to volumes owned by clients other than themselves, set `AC_VOL_DEFAULT` to `ACCESS`.

Command Access Control Scenario 1

In this scenario, you want to allow most clients access to most commands, but you want to allow only `client_3` access to the <u>st</u>art command. To do this, verify that the `AC_CMD_DEFAULT` variable is set to `ACCESS` and create a `command.START.allow` file with `client_3` listed.

Your file will look like the following example:

```
#   Filename: command.START.allow
#
#   This file contains the user_IDs of all clients allowed to perform the
#   START command.
#
#   Last modified: 92/08/25   Bill Johnson File created
#
client_3   Smith-Jones accounting
```

Figure 22. Sample `command.START.allow` **file**

Command Access Control Scenario 2

In this scenario, you want to allow most clients access to most commands, but you want to prevent `client_4` and `client_5` from using the <u>ej</u>ect command. To do this, verify that the `AC_CMD_DEFAULT` variable is set to `ACCESS` and create a `command.EJECT.disallow` file with `client_4` and `client_5` listed.

Your file will look like the following example:

```
#       Filename: command.EJECT.disallow
#
#       This file contains the user_IDs of all clients
#       restricted from performing the EJECT command.
#
#       Last modified: 92/08/25  Bill Johnson  File created
#
client_4       Personnel
client_5       Hawkins
```

Figure 23. Sample command.EJECT.disallow **file**

Note: An alternative way to achieve the same result would be to create an allow file and give client_1 , client_2, and client_3 access to the <u>ej</u>ect command. However, since this allow file would require more entries, it would take more time to set up and maintain.

Command Access Control Scenario 3

In this scenario, you want to allow client_1 access to all commands; client_2 and client_3 access to <u>mou</u>nt and <u>dis</u>mount commands only; and client_4 and client_5 access to <u>mou</u>nt, <u>dis</u>mount, <u>en</u>ter, and <u>ej</u>ect commands. To do this, create a command.ALL.allow with client_1 listed.

Your file will look like the following example:

```
#       Filename: command.ALL.allow
#
#       This file contains the user_IDs of all clients
#       with access to all commands.
#
#       Last modified: 92/08/25  Bill Johnson  File created
#
client_1       Payroll
```

Figure 24. Sample command.ALL.allow **file**

Then create a series of allow files that list which clients can use the other specific commands.

Your allow files will have the following names and entries.

```
command.MOUNT.allow
        client_2
        client_3
        client_4
        client_5
_____
command.DISMOUNT.allow
        client_2
        client_3
        client_4
        client_5
_____
command.ENTER.allow
        client_4
        client_5
_____
command.EJECT.allow
        client_4
        client_5
```

Figure 25. `allow` **Files Names and Entries**

Note: In the above scenario, the `AC_CMD_DEFAULT` setting is irrelevant, since `command.ALL.allow` governs behavior for all commands. However, you may want to set `AC_VOL_DEFAULT` to `NOACCESS`.

Volume Access Control Scenario 1

In this scenario, you want to restrict volume access to the owner of a volume only. To do this, verify that the `AC_VOL_DEFAULT` variable is set to `NOACCESS` and make sure that none of the following files exist.

- `users.ALL.allow` or `users.ALL.disallow`

- `users.COMMAND.allow` or `users.COMMAND.disallow`

  Where *COMMAND* is any ACSLS command.

Volume Access
Control Scenario 2

In this scenario, you want to, in general, restrict volume access to the volume owner, but you want `client_1` and `client_2` to be able to mount and dismount volumes belonging to either `client_3` or `client_4`. To do this, verify that the `AC_VOL_DEFAULT` variable is set to `NOACCESS` and create a `users.MOUNT.allow` with `client_1` and `client_2` having mount access to volumes owned by `client_3` and `client_4`.

Your file will look like the following example:

```
#   Filename: users.MOUNT.allow
#
#   This file contains the user_IDs of all clients allowed to perform the
#   MOUNT command on volumes owned by the specified client.
#
#   Last modified: 92/08/25 Bill Johnson File created
#
client_3        client_1        client_2
client_4        client_1        client_2
```

Figure 26. Sample `users.MOUNT.allow` *file*

Then create a `users.DISMOUNT.allow` file with the same entries, so that `client_1` and `client_2` have dismount access to volumes owned by `client_3` and `client_4`.

Volume Access
Control Scenario 3

In this scenario, you want to, in general, restrict volume access to the volume owner, but you want `client_5` to be able to access all volumes, regardless of command. You also want to allow `client_1` to use the <u>mount</u> <u>rea</u>donly and <u>dis</u>mount commands on volumes belonging to `client_4`. To do this, create a `users.ALL.allow` with `client_5` having access to all commands for all other clients' volumes.

Your file will look like the following example:

```
#   Filename: users.ALL.allow
#
#   This file contains the user_IDs of those clients having access to all
#   volumes owned by the specified clients.
#
#   Last modified: 92/08/25 Bill Johnson File created
#
client_1        client_5
client_2        client_5
client_3        client_5
client_4        client_5
```

Figure 27. Sample users.ALL.allow ***file***

Then create a users.MOUNT_READONLY.allow file with
client_1 having MOUNT_READONLY access to volumes owned
by client_4.

Your file will look like the following example.

```
#   Filename: users.MOUNT_READONLY.allow
#
#   This file contains the user_IDs of all clients allowed to perform the
#   MOUNT_READONLY command on volumes owned by the specified client.
#
#   Last modified: 92/08/25 Bill Johnson File created
#
client_4        client_1
```

Figure 28. Sample users.MOUNT_READONLY.allow ***file***

Finally, create a users.DISMOUNT.allow file with the same
entry, so that client_1 has DISMOUNT access to volumes
owned by client_4.

Note: In the above scenario, the AC_VOL_DEFAULT setting is
irrelevant, since users.ALL.allow governs behavior for all
commands. However, you may want to set AC_VOL_DEFAULT to
NOACCESS.

Volume Access Control Scenario 4

In this scenario, you want to, in general, restrict volume access to the volume owner, but you want to allow all clients except `client_5` to access volumes owned by `client_2`. However, you don't want these clients to use the <u>eject</u> command. To do this, verify that the `AC_VOL_DEFAULT` variable is set to `NOACCESS` and create a series of `users.`*`COMMAND`*`.allow` files showing `client_2`   `client_1`   `client_3`   `client_4` for each command except the <u>eject</u> command.

Your files will look like the following example:

```
#   Filename: users.MOUNT_READONLY.allow
#
#   This file contains the user_IDs of all clients allowed to perform the
#   MOUNT_READONLY command on volumes owned by the specified client.
#
#   Last modified: 92/08/25   Bill Johnson   File created
#
client_2        client_1        client_3        client_4
```

Figure 29. Sample `users.`*`COMMAND`*`.allow` **file**

> **Note:** For the conditions set out in this scenario, creating a `users.ALL.allow` would not work because it leaves you no way to restrict access to the <u>eject</u> command.

Volume Access Control Scenario 5

In this scenario, you want `client_1` to have access to a subset of volumes owned by `client_2`. To accomplish this, you need to set up a "virtual owner", `client_3,` to own the subset of `client_2`'s volumes. Then, give `client_1` and `client_2` access to those volumes owned by `client_3`.

`client_3` is referred to as a "virtual owner" because `client_3` does not exist as a host or a real user. The sole purpose of `client_3` is to allow other "real" clients or users to share subsets of volumes.

To do this, verify that the `AC_VOL_DEFAULT` variable is set to `NOACCESS` and create a `users.ALL.allow` file with `client_1` and `client_2` having access to `client_3`'s volumes.

Your file will look like the following example.

```
#  Filename: users.ALL.allow
#
#  This file contains the user_IDs of those clients having access to all
#  volumes owned by the specified clients.
#
#  Last modified: 92/08/25   Bill Johnson   File created
#
client_3        client_1        client_2
```

Figure 30. Sample users.ALL.allow *file*

Maintaining and Modifying ACSLS Access Control

Once ACSLS access control is set up, you may need to perform the following tasks to maintain and modify it.

- Logging access control messages in the event log.

- Modifying or adding access control files, including the internet.addresses, adi.names, and lu62.names files and the allow, and disallow files.

- Reinitializing the access control information.

- Reporting on volume ownership.

Logging Access Control Messages

The dynamic variable AC_LOG_ACESS specifies whether a message is logged in the event log when access to a command or a volume is denied. By default, AC_LOG_ACESS is set to False. Set it to True to enable this function. For more information, see *Reconfiguring ACSLS* in "Chapter 6, Verifying and Changing Dynamic and Static Variables."

Reporting on Volume Ownership

query volume does not report on volume ownership. The only way to discover the owners of volumes is to run volrpt with the -f and -z options, as described below:

- -f specifies that the contents of *filename* be used to create a customized volrpt

  Note: If the -f option is used, *filename* can be a dash (–), which specifies that the input will come from stdin.

  Input from stdin is terminated with ⟦CTRL⟧ + D.

- -z causes the *cell_id* (acs,lsm,panel,row,column) and *drive_id* (acs,lsm,panel,drive) fields to be zero-filled

Figure 31 contains a sample file for use with the -f option. A similar sample file, owner_id.volrpt, is provided in the following directory:

    $ACS_HOME/data/external/volrpt

The sample file in Figure 31 shows the valid field names (which must be spelled exactly as shown in uppercase), the default field lengths, and the default delimiter length:

```
####################################################################
#
# File name: owner_id.volrpt
#
# This file describes the report layout for volrpt invoked with the -f option.
#       volrpt -f <filename>
#
# The format of a line is:
#       field_name   field_length   delimiter_length
#
# The field length is the number of characters which will be printed for
# the field. The delimiter length is the number of spaces that will be
# printed after the field.  If you leave out the lengths, or specify a
# value of -1, the default values will be used. Default delimiters are
# always 2. Here are the fields and their default lengths.
#
# ACCESS_COUNT          5         2
# ACCESS_DATE           15        2
# CELL_ID               13        2
# DRIVE_ID              10        2
# ENTRY_DATE            15        2
# LABEL_ATTR            5         2
# LOCK_ID               5         2
# LOCK_TIME             15        2
# MAX_USE               5         2
# MEDIA_TYPE            7         2
# OWNER_ID              20        2
# POOL_ID               5         2
# VOLUME_ID             6         2
# VOL_STATUS            17        2
# VOLUME_TYPE           4         2
#
# Revision History:
# xx/xx/xx  Name        Changes
#
####################################################################
VOLUME_ID       6         2
VOL_STATUS      17        2
DRIVE_ID        12        2
CELL_ID         15        2
OWNER_ID        -1        0
```

Figure 31. Sample owner_id.volrpt **File**

The input file consists of multiple lines, one line for each field to be printed on the report line. Fields are printed across the report line in the order they appear in the file. There is no attempt made to restrict fields to fit within an 80 character line, so users can put as many fields as they wish on a line. A line consists of:

> field_name   field_length   delimiter_length

Where `field_length` is the number of characters to print for the field and `field_delimiter` is the number of spaces to print after the field. Lines starting with # are comment lines, and blank lines are ignored.

If a `field_length` or `delimiter_length` is not specified, the default values are used. These values are shown in Figure 31. Any field or delimiter length can be specified as `-1` which means use the default value. This is useful if the user wants to use the default field length, but wants to change the delimiter length. Thus the last field in the file might be specified as `-1 0` to get the default field length and to print out no spaces after the field.

If numeric fields (<u>poo</u>l, *pool_id*, *lock_id,* maximum use, access count) or *identifier* (cell, <u>dr</u>ive) are too long for the specified format, asterisks are printed instead. All other fields are truncated if the format is shorter than the length needed to show the field.

Figure 32 contains a sample volume report generated using the `-z` and `-f` options with `owner_id.volrpt` as the input file.

```
1998-06-30 14:02:18

TOTAL VOLUMES: 2      SEQUENCE: sort by volume identifier

Volume  Volume                          Home          Owner
Label   Status              Drive ID    Location      ID

RB1400  VOLUME_HOME         Not-in-drv  0, 1, 1, 0, 0 cray
RB1401  VOLUME_IN_DRIVE     0, 0, 1, 0  0, 1, 2, 0, 0 cray
```

Figure 32. Sample `owner_id.volrpt` ***Using*** `-f` ***Option***

Error Conditions
The following are common error conditions you might encounter when creating the volrpt.

- If the file specified with the -f option is not found, volrpt prints a message to stderr and exits.

- If more than one -f option is specified, volrpt prints a message to stderr and exits.

- If a field name is misspelled, field values are non-numeric, or field values are less than –1 or greater than 255, a message is printed to stderr and the line in error is ignored.

- If a field is specified on more than one line, the second and subsequent lines are ignored and a message is printed to stderr. (This means that duplicate fields are ignored.)

Modifying or Adding Access Control Files

To maintain ACSLS access control, you'll probably need to modify or add new client-identification files:

- internet.addresses file for TCP/IP protocol clients

- adi.names file for OSLAN protocol clients

- lu62.names file for SNA protocol clients. (AIX platform for ACSLS only)

You will also modify or add new allow or disallow files.

The existing ACSLS access control files are located in the $ACS_HOME/data/external/access_control directory. To modify these files, use vi or another text program to make the required changes. Then save the files and reinitialize access control. For more information, see "Chapter 6, Verifying and Changing Dynamic and Static Variables.

Note: If you have questions about the format of the information in the client identification files or the allow, and disallow files, see Option 4 in Chapter 6.

To add new files, copy, rename, and modify the appropriate sample files, which reside in the `$ACS_HOME/data/external/access_control` directory. Then save the files and reinitialize access control. For more information, see "Chapter 6, Verifying and Changing Dynamic and Static Variables".

Reinitializing Access Control Information

During configuration, ACSLS reads the access control information from the `internet.addresses`, `adi.names`, and `lu62.names` files, and the `allow`, `disallow`, and `ownership.assignment` files. ACSLS does not dynamically update the configuration when one of these files changes or a new file is added. In order to reinitialize the information, you must rebuild the access control information by running the `acsss_config` program, Option 6. For more information, see *Reconfiguring ACSLS* in "Chapter 6, Verifying and Changing Dynamic and Static Variables."

➡️ **Rebuild the Information from the Access Control files.**

To rebuild the information, select the `Rebuild Access Control` information option through the `acsss_config` configuration script.

1. Enter the following to initiate the configuration program:

   `acsss_config`

   The following menu appears:

```
                    ACSLS feature configuration
      Please enter the number followed by return for your choice from
      the following menu to configure product behavior in that area.
 Menu choice:
                1:  Set CSI tuning variables
                2:  Set event logging variables
                3:  Set general product behavior variables
                4:  Set access control variables
                5:  Set automatic backup parameters
                6:  Rebuild access control information
                7:  Event Notification settings
                8:  Define or Change Library Hardware Configuration
                E:  Exit
```

Figure 33. ACSLS Feature Configuration Menu

2. At the ACSLS feature configuration menu, `select Option 6`.

    The system dynamically rebuilds the ACSLS access control information and then the ACSLS feature configuration menu reappears.

    Note: You do not need to stop and restart ACSLS.   .

3. To exit, enter **9**.

Chapter 9. Library Management

Managing your library(ies) may consist of the following tasks:

- auditing your libaries

- adding a SCSI–attached library

- adding an mchanger device node

- removing an mchange device node

- using the Extended Store Feature

- managing a mixed–media library

- managing a Dual-LMU configuration

- managing a Dual-LAN client configuration

- registering the IP addresses of Primary and Secondary LANs

- setting the TCP/IP Connection timeout interval

- troubleshooting library connections

- registering for event notification

Auditing the Library

When to Run an Audit

An audit updates the ACSLS database to match the actual inventory of library volumes. You run an audit to:

- Create volume information in the database if you do not enter volumes through the CAP. For example, run an audit if you add an LSM to your library, open the LSM door, and manually add volumes to the LSM.

  Caution: After you install a new ACS or LSM, make sure that each attached LMU and LSM is fully (hardware) configured, powered on, and ready before you reconfigure ACSLS. Otherwise, the `acsss_config` script will fail.

- Resolve discrepancies between the library and the database. For example, run an audit if you open an LSM door and manually remove volumes instead of ejecting them through the CAP. The audit either marks the volume absent or deletes information for the removed volumes from the database.

An audit ejects errant volumes and either marks the volume absent or deletes their information from the database. An errant volume has:

- An external label that duplicates one already scanned.

- A missing or unreadable external label and no virtual label.

- An invalid media type.

- An invalid volume ID.

ACSLS records any database changes from the audit in the event log and also displays `cmd_proc` messages during the audit. Audits only apply to LSM storage cells, not to transports or CAPs. For information about running an audit, see the <u>audit</u> command on page 367.

Note: Audit recognizes particular models of cleaning cartridges and will record them in the database as cleaning cartridges. However, the audit command does not set the Max Uses for new

cleaning cartridges it encounters. You will have to set the Max Uses for these using the `set clean` command on pages 271 and 477.

Audit Intervals   Audit intervals depend on several factors, including your ACSLS configuration, your library configuration, the number of database changes required, and the scope of the audit. Table 14. describes how the differences in the scope of an audit affect the audit intervals.

Table 14. How the Scope of an Audit Affects the Audit Interval

This audit takes less time than...	This audit
A diagnostic ACS/LSM	An online ACS/LSM
An ACS/LSM dedicated to the audit	An ACS/LSM processing other requests
A full panel	A (partially or completely) empty panel
A drive panel	A standard panel
An inside panel	An outside panel

In addition, consider the LSM type for the component you audit, as shown in Table 15.

Table 15. Average Audit Times for Supported LSMs

LSM Type	Component	Average Audit Time
4410	LSM	8.5 hours
	Panel	25 minutes
	Single cell	15 seconds
9310	LSM	LSM 6 hours Panel 20 minutes Single cell 10 seconds
9360	LSM	5 minutes

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Table 15. Average Audit Times for Supported LSMs

LSM Type	Component	Average Audit Time
97*xx*	LSM	1 minute

Note: These times assume no other active processes. 4410 and 9310 audit times may be reduced if a high percentage of the cells audited are occupied.

Adding a SCSI–Attached Library to ACSLS

Use this procedure when you are adding a SCSI-attached LSM (such as the 9710) to ACSLS. In this procedure, you install the SCSI device driver.

⇨ **To add a SCSI-attached LSM to ACSLS, do the following:**

1. Log in as `acsss`.

2. Change to the install directory:

   `cd /ACSSS/install`

3. Log in as `root`.

   `su root`

4. Enter the following command:

   `. /install_scsi `*`platform`*`.sh`

   Where *`platform`* is **sol** for Solaris or **aix** for AIX..

5. Respond to the prompts to install the SCSI device driver.

Creating an mchanger device node

The mchanger is the device driver that communicates between ACSLS and any SCSI library. An mchanger must be created for each SCSI–attached library that is connected to ACSLS. Adding an mchanger device is part of the installation process. However, there may be times when you need to add a new SCSI library to an existing ACSLS installation. In this case, you must create a new mchanger device node. To do this:

1. Login to the ACSLS server as **root** user and enter your password.

2. Go to the installation directory:

   `cd/export/home/ACSSS/install`

3. Make sure that the SCSI library is functional and attached to the ACSLS server.

4. Invoke the driver installation script:

   `./install_scsi_sol.sh` (for Solaris)

   `./install_scsi_aix.sh` (for AIX)

You are prompted for the specific host–bus adapter and target ID of each library. If you do not know the target ID:

○ Access the operator panel on the library

○ Select the menu options to display the SCSI target ID

Removing an mchanger device node

You may want to remove an mchanger in the event:

- you have changed the target ID of your library, and want to remove the original node.

- the mchaner device node has been corrupted and you must build a new one

1. Login to the ACSLS server as **root** user and enter your password.

2. Remove the mchanger device(s):

   For Solaris, type:

   rm_drv mchanger

   The Solaris kernel is rebuilt. All instances of mchanger are removed.

   For AIX, type:

   rmdev −l mchangerX −d

   where X is the specific instance of mchange that you want to remove.

Using the Extended Store Feature

The following sections provide information about using the Extended Store Feature.

Note: This feature does *not* apply to a single LSM without a pass-thru port.

When a volume is mounted, its "home location" is the storage cell from which it was mounted. ACSLS attempts to return a volume to its home location after a dismount if that home location is in an LSM that is enabled for the Extended Store feature. Events such as a label mismatch on a dismount, however, may prevent ACSLS from returning a volume to its home location. If such an event occurs, the volume is stored in the LSM from which it was dismounted.

If you have an Extended Store LSM that you use for volume archive, this feature helps to ensure that volumes mounted from that LSM return to their home locations in that LSM. For example, if Extended Store LSM 3 is enabled for this feature and a volume from LSM 3 is mounted on a drive attached to LSM 1, after the volume is dismounted, ACSLS will attempt to return the volume to its home location in LSM 3. If LSM 3 is not enabled, ACSLS will store the volume in a new cell in LSM 1.

You can only enable entire LSMs for this feature. You cannot enable LSM subcomponents, such as a panel or individual cell. To enable an entire ACS for this feature, you must enable each LSM in the ACS.

Note: Enabling the Extended Store feature will increase pass–thru activity when volumes are dismounted. This may significantly decrease library performance.

To enable an LSM for the Extended Store feature, modify the `lsm_fixed_volume` file (found in the `$ACS_HOME/data/external/fixed_volume` directory) shown in Figure 34. After you modify the file, stop and restart ACSLS to enable the specified LSMs.

Use the following conventions when you modify the sample file:

- Comment and blank lines are allowed throughout the file.

- Each LSM identifier line consists of the ACS number, followed by a comma, followed by the LSM number. No spaces or tabs are allowed between the ACS number and the LSM number.

- Each LSM identifier must be on a separate line.

- No explicit ordering of the LSM identifier lines is required.

- No explicit end–of–file delimiter is required.

```
# This lsm_fixed_volume file must be found in the
# $ACS_HOME/data/external/fixed_volume
# directory.  This is a sample lsm_fixed_volume file that may be

# edited your particular configuration.

# Comments may appear anywhere in this file, but must include a
# pound sign in the first column.

# Blanks lines are also allowed throughout the file for
# readability, and
# will be ignored.

# For all the LSM identifiers found in this file, a "best" attempt
# will be
# made to return the volume to its home location at dismount.

# A valid LSM identifier consists of the the ACS number, separated by a
comma,
# and followed by the LSM number.  Leading or trailing blanks are
# ignored.

#      ACS,LSM

#      0,0
#      0,1

# ACS 1, LSM 0 through 3
#      ACS,LSM
#      1,0
#      1,1
#      1,2
#      1,3
```

Figure 34. Sample Extended Store Feature Control File

Figure 35 shows an example of a modified control file. In this
example, the comment (#) character has been removed from the
lines shown in bold to specify that LSMs 0,0 and 0,1 are
enabled.

```
# This lsm_fixed_volume file must be found in the
# $ACS_HOME/data/external/fixed_volume
# directory.  This is a sample lsm_fixed_volume file that may be

# edited your particular configuration.

# Comments may appear anywhere in this file, but must include a
# pound sign in the first column.

# Blanks lines are also allowed throughout the file for
# readability, and
# will be ignored.

# For all the LSM identifiers found in this file, a "best" attempt
# will be
# made to return the volume to its home location at dismount.

# A valid LSM identifier consists of the the ACS number, separated by a
comma,
# and followed by the LSM number.  Leading or trailing blanks are
# ignored.
#      ACS,LSM

       0,0
       0,1
# ACS 1, LSM 0 through 3
#      ACS,LSM
#      1,0
#      1,1
#      1,2
#      1,3
```

Figure 35. Modified Extended Store Feature Control File

Managing a Mixed-Media Library

"Mixed media support" means that ACSLS supports a mixture of transport and media (cartridge) types in the same library. ACSLS mixed–media support prevents the LSM robot from mounting incompatible media types in a transport. For example, in a 9310 LSM, the robot will not mount a DD3A cartridge (helical recording) in a 9490 transport (parallel recording). Note that ACSLS mixed-media support requires media ID labels with media characters on cartridges, as described in "Media Characteristics" in *Product Information*. For more information, see the following sections of this book or the *Product Information*:

- "LSM, Transport, and Media Compatibility" in *Product Information*

- "Transport and Media Compatibility" in *Product Information*

- "Media Characteristics" in *Product Information*

- "Mixed-Media Restrictions for SCSI-Attached LSMs" on page 211

- "Setting Scratch Preferences" on page 212

ACSLS does *not*, however, support mixed format recording. Because ACSLS does not have access to the data path to a transport, ACSLS cannot detect and prevent mixed-format recording incompatibilities.

Caution: The venter command does not provide an option to specify the media type of the cartridge you want to enter. In a mixed-media environment, ACSLS cannot prevent transport/media incompatibilities for virtually entered cartridges!

**Using Mixed-Media
Support with
3490E Cartridges**

An LSM's vision recognition system can determine the media type if the 3490E cartridge has the "E" media label on the volume label edge of the cartridge. The media label is a separate, single character, bar code label below the six–character volume label. Cartridges without the media label are considered 3480 cartridges by 1/2" cartridge standards.

StorageTek recommends that when you purchase new 3490E cartridges, you order them with the "E" media label to enable ACSLS to provide automatic mixed media protection for those volumes. StorageTek strongly suggests that, if practical for your site, you apply "E" media labels to any existing 3490E cartridges without such labels to allow ACSLS to provide automatic protection for those volumes as well. If you choose to use 3490E cartridges without "E" media labels in a mixed-media environment, you, not ACSLS, must explicitly manage those volumes. For example:

- A 3490E volume without the "E" seventh media character appears as a 3480 cartridge on volume reports and as a query volume response. You must, therefore, know which 3490E volumes are incorrectly labelled, and must explicitly mount them in a compatible drive (4490 or 9490).

- Similarly, you must explicitly manage incorrectly labelled 3490E scratch tapes as follows:

  ○ First, you must create a homogeneous scratch pool containing only the incorrectly labelled 3490E tapes. When you create this pool, do not specify the overflow option unless the common scratch pool is a homogeneous pool that contains only 3490E tapes.

  ○ Next, you must add an entry to the scratch preferences to permit mounting 3480 scratch tapes as an alternate choice for both 4490 and 9490 drives.

  ○ Finally, when you enter a mount scratch command, you must specify the pool ID of the incorrectly labelled 3490E tapes and the ANY_MEDIA_TYPE or ANY_MEDIA_TYPE keyword.

Caution: If you modify the scratch preferences file as described, a `mount scratch` command for a 4490 and 9490 drive will mount a 3480 cartridge when the pool no longer contains 3490E cartridges.

- `query mount` and `query mount scratch` commands will not return accurate media type information for incorrectly labelled 3490E cartridges. Again, you must know by volume ID which volumes that appear as 3480 volumes are actually 3490E volumes.

Mixed–Media Restrictions for SCSI-Attached LSMs

Please note the following restrictions for SCSI-attached LSMs:

- ACSLS does not provide readonly protection for cartridges mounted in transports attached to a SCSI-attached LSM. That is, even if you specify the `readonly` option on a `mount` command, the transport can still write to the cartridge. To write protect cartridges for these transports, you must use the cartridge's readonly protection (such as a thumbwheel).

- ACSLS does *not* support the `venter` command for SCSI-attached LSMs with DLT transports.

- You cannot do manual mounts and dismounts to DLT transports in SCSI-attached LSMs . CompacTape cartridges, therefore, must have external labels to allow ACSLS to manage these cartridges.

- ACSLS does *not* support auto-cleaning for transports in SCSI-attached LSMs. Using ACSLS, you can only manually clean these transports. You can, however, enable auto–cleaning via the LSM control panel. For more information, see your LSM documentation.

- You can select a normal load or fast load option via the 97*xx* control panel. Not all tape management systems, however, support the fast load option.

Setting Scratch Preferences

On scratch mount requests you can explicitly specify the media type you want to use, or you can have ACSLS select a media type.

In order for ACSLS to select a media type, you must pre-define a prioritized list of compatible media types for each drive type. This list is referred to as the "scratch preferences."

For example, on TimberLine (9490) drives, you may want to use 3490E cartridges before 3490 or 3480 ones. To do this, you would define 3490E cartridges as the highest priority for 9490 drives, followed by 3490 and 3480 cartridges. Note that:

- There is one set of preferences for the entire server; preferences are not defined by client.

- If a compatible media type is not listed for a drive, the media will not be selected.

The following sections describe the user- and system-defined files that ACSLS uses in determining scratch preferences.

User-Defined Mixed-Media Files

Table 16. describes the user-defined mixed-media files that are located in `$ACS_HOME/data/external/mixed_media/`:

Table 16. User-Defined Mixed-Media Files

File	Description
`scratch_preferences.dat`	User-defined preferences file. Primary source of preference definitions.
`scratch_preferences.SAMPLE`	Sample preferences file. Can be copied to create the scratch_preferences.dat file.

System-Defined
Mixed-Media Files

Table 17. describes the system-defined mixed-media files that
are located in $ACS_HOME/data/internal/mixed_media/:

Hint: You cannot modify the system-defined mixed-media files.

Table 17. System-Defined Mixed-Media Files

File	Description
media_compatibility.dat	System-defined preferences file. Used only if the user-defined file does not exist or is missing a drive type.
drive_types.dat	System-defined list of supported drive types.
media_types.dat	System-defined list of supported media types.

How ACSLS Uses
the Mixed-Media
Files

Table 18. describes how ACSLS uses the mixed-media files to
select a media type for a scratch mount request.

Table 18. How ACSLS Uses Mixed-Media Files

If the scratch_preferences.dat file ...	ACSLS does this...
Does not exist.	Uses the definitions in the system file, media_compatibility.dat.
Lists more than one media type for a drive.	Selects the media types in the order listed.
Lists no media type for a particular drive.	Uses the data in the system file, media_compatibility.dat.
Does not list a particular drive type.	Uses the data in the system file, media_compatibility.dat.

Defining a Scratch
Preferences File

Use this procedure to define a `scratch_preferences.dat` file,
which contains an ordered list of scratch cartridge types to select
for given drive types. ACSLS uses this file for <u>moun</u>t *
command where a media type is not explicitly specified. Figure
36 shows the contents of the `scratch_preferences.SAMPLE`
file.

```
Drive Type Name         Media Type Preference Name
4480                    3480
4490                    3490E
9490                    3490E
SD3                     DD3A
SD3                     DD3B
SD3                     DD3C
```

Figure 36. scratch_preferences.SAMPLE

▷   **To define a scratch preferences file, do the following:**

1. Log in as acsss.

2. Change to the external mixed media directory:

    cd $ACS_HOME/data/external/mixed_media

3. Copy the sample scratch preferences file to create the user-defined file:

    cp scratch_preferences.SAMPLE
    scratch_preferences.dat

4. Using a text editor such as vi, modify the list of preferences in the scratch_preferences.dat file:

    ○ Follow the instructions in the comments at the top of the file.

    ○ If you want to use more than one media type for a drive type, enter each media type on a separate line; the order of preference is from top to bottom.

5. Save the file.

6. From a cmd_proc, restart ACSLS:

    start

See Also

- set scratch command, page 483.

Managing a Dual-LMU Configuration

ACSLS 5.2 and above supports *dual-LMU configurations*, which consist of:

- *A master LMU* that manages an ACS

- *A standby LMU* that automatically switches to master role to manage the ACS if the master LMU fails

Both LMUs are connected to a LAN that is connected to the LSM. The first LMU powered on is initially the master, while the second LMU powered on is initially the standby. The LMUs periodically check each other's status so the standby can take over the master role if the master fails.

Note: ACSLS supports dual-LMU configurations for *only* the 9330 LMU with host/LMU microcode compatibility Level 12 loaded. The same microcode level must be loaded in both LMUs.

Hint: To further enhance the redundancy of a dual-LMU configuration, StorageTek recommends that you use dual cables to connect the ACSLS server to *each* LMU. Figure 37 shows an example of an ACSLS SPARCStation 5 server in a dual-LMU configuration. In Figure 37, a port on the SPARCStation 5 connects to a serial patch panel, which has dual cabling to each LMU.
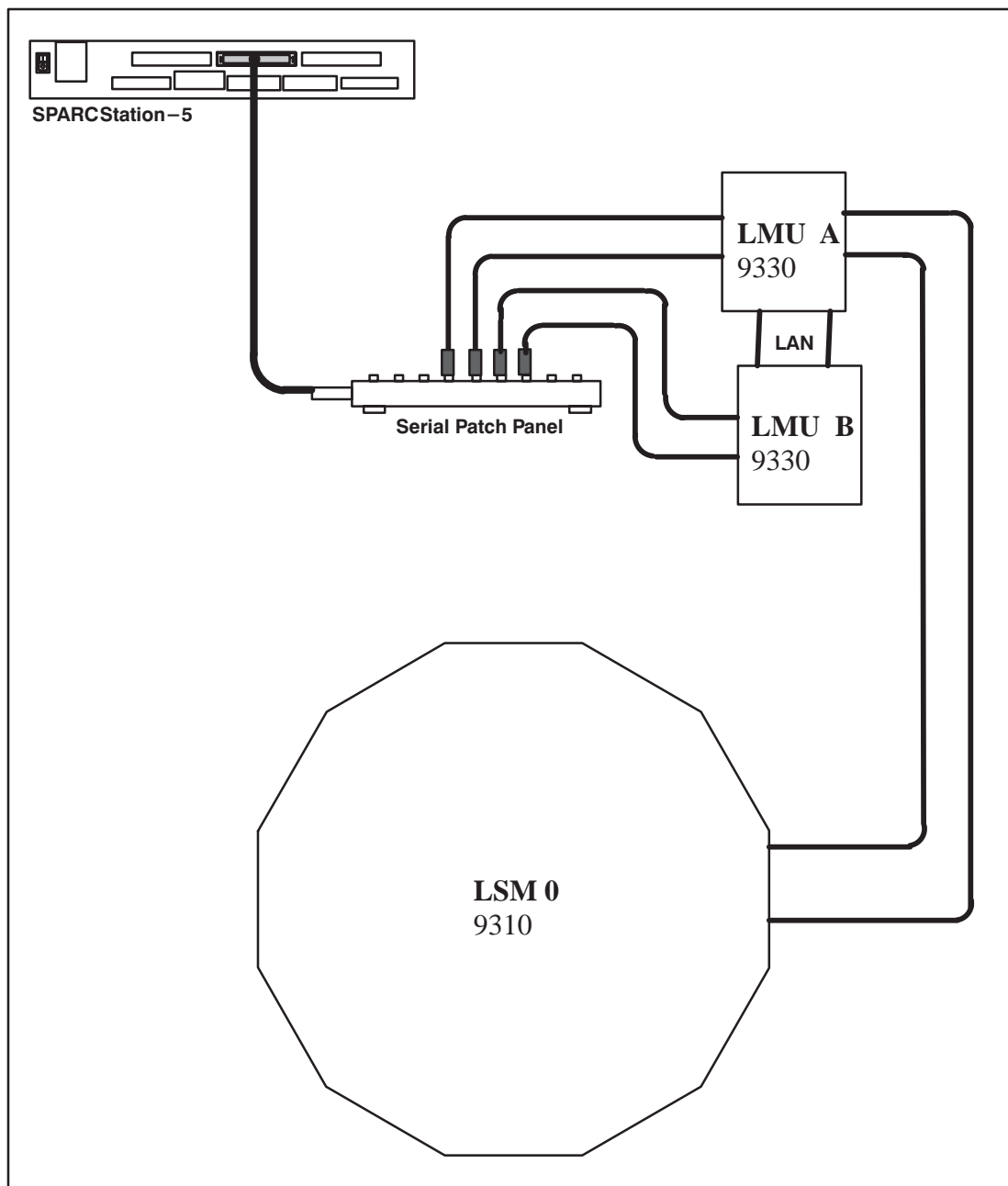
Figure 37. ACSLS Server in Dual–LMU Configuration

ACSLS dual-LMU support also enhances single-LMU configurations because the LMU can IPL without bringing down the ACSLS server.

The `query lmu` command displays LMU and port status for both single-LMU and dual-LMU ACS configurations; for more information, see the `query lmu` command on page 441.

You can also use the `switch lmu` command to manually switch ACS management from the ACS's master LMU to the standby LMU; for more information, see the `switch lmu` command on page 490. You can use manual switchover for hardware maintenance, such as replacing a LAN cable connecting dual LMUs. For example, assume that LMU A is in the master role and LMU B is in the standby role. If you need to replace a LAN cable, you can:

1. Switch to LMU B.

2. Vary the port(s) to LMU A offline.

3. Replace the LAN cable.

4. Vary the port(s) to LMU A back online.

5. Switch back to LMU A.

After an LMU switchover (automatic or manual), ACSLS recovers all outstanding (active and pending) requests. The time to complete each outstanding request during a switchover is increased by the time required to switch between LMUs and recover any preceding outstanding requests. Request recovery, therefore, can take three to five minutes.

Managing a Dual-LAN Client Configuration

ACSLS 5.2 and above supports *dual-LAN client configurations*, which consist of a primary LAN and a secondary (backup) LAN. If the primary LAN fails, the client switches to the secondary LAN.   ACSLS removes all outstanding messages to that client and begins communicating via the secondary LAN. Because ACSLS removes all outstanding messages before switching over to the secondary LAN, a client will not receive a success message even though a request completed successfully.

For example, a client requests ACSLS to eject ten volumes. ACSLS starts ejecting the volumes, then communications fail between ACSLS and the primary client LAN. ACSLS removes all outstanding messages to that client and begins communicating via the secondary LAN.   ACSLS successfully completes ejecting all ten volumes, but sends no success message to the client. The client must verify that the request completed successfully. In this example, if the client issues a `query volume` request against the IDs of the ejected volumes, ACSLS returns a `volume not found` error message, which confirms that ACSLS ejected the volumes.

ACSLS ensures that any transient requests complete successfully if a LAN communications switchover occurs. After switchover, however, the client must cancel any persistent outstanding requests (such as CAP operations) originally submitted on the primary LAN and resubmit these requests via communications from the secondary LAN. Resources (such as, CAPs, locks, drives, and so forth) allocated via primary LAN communications will remain allocated after switchover to the secondary LAN.

The following sections tell how to configure ACSLS for dual-LAN client operations by:

- Register the IP addresses of primary and secondary LANs by creating a `csc_ip_switch.dat` file

- Install a second ethernet port for a multi–homed ACSLS server

- Set the TCP/IP connection timeout interval to decrease the system switchover time to the backup LAN.

Registering the IP addresses of Primary and Secondary LANs

To register the IP addresses of the primary and secondary LANs with ACSLS, create the file `csc_ip_switch.dat` in the `$ACSSS_HOME/data/internal/client_config/` directory. Figure 38 shows an example of a `csc_ip_switch.dat` file.

```
#The following entry is System Zed's primary and secondary LAN IP addresses.
129.80.30.40   129.80.30.50
```

Figure 38. Example of `csc_ip_switch.dat` **File**

As Figure 38 shows, use a # sign to precede comments. The entries consist of a client system's primary LAN IP address in the left column followed by one or more blanks, then a client system's secondary LAN IP address in the right column. In this example, System Zed's primary LAN IP address is 129.80.30.40 and its secondary LAN IP address is 129.80.30.50.

After you create or update the the `csc_ip_switch.dat` file, if ACSLS is running, you must stop and restart ACSLS. If ACSLS is not running, start ACSLS. For more information, see "Stopping ACSLS" on page 7 and "Starting ACSLS" on page 6.

If ACSLS successfully reads the `csc_ip_switch.dat` file on restart, ACSLS logs the success message `2010 I DUAL PATH OPTION ACTIVATED` in the he ACSLS event log. Otherwise, dual-LAN support is not activated.

Installing a Second Ethernet Port for a Multi-Homed ACSLS Server

This section describes the procedure for installing a second ethernet port for a multi–homed ACSLS server. The second ethernet port provides the attachment to the second control path adapter, which controls the backup LAN. This procedure requires the Sun SBUS Buffered Ethernet card. You can order this Ethernet card from Sun as part number X1053A or from StorageTek as part number 309479501.

The installation procedure includes:

- Installing the hardware and rebuilding the kernel

- Defining a host name for the new ethernet port

- Creating the `/etc/notrouter` file

To install a second ethernet port, do the following:

1. Install the Sun SBus Buffered Ethernet card according to the manufacturer's instructions.

2. Reconfigure the system kernel for the new device:
    e. Power the system on. When it begins to boot, press ⟦STOP⟧ – ⟦A⟧ to enter the PROM monitor.

    f. At the `ok` prompt, boot the server:

       boot -r

3. When the boot has completed, login as `root`.

4. Create a hostname for the second ethernet port.

   echo *2nd_host_name* **>** **/etc/hostname.le1**

   Where *2nd_host_name* is the hostname for the second ethernet port.

5. Enter the following:

touch /etc/notrouter

This creates the /etc/notrouter file.

6. Reboot the server:

reboot

This completes this procedure.

Setting the TCP/IP Connection timeout interval

The UNIX system variable tcp_ip_abort_cinterval sets the TCP/IP connection timeout interval between the client and the ACSLS server. Changing the default value (180 seconds) of this variable may decrease the switchover time to the backup LAN. Note, however, that actual switchover time depends on the configuration and type of failure. For example, if an ACSLS server port fails and multiple clients are communicating via this port, ACSLS serially recovers communications with each client. Multi–client recovery for a failing port therefore takes longer than recovery with a single client communicating with a failing port.

To decrease the switchover time to the backup LAN, do the following:

1. Log in as root on the ACSLS server.

2. From the prompt, enter the following:

/usr/sbin/ndd -set /dev/tpc tcp_ip_abort_cinterval 15000

This command changes the TCP/IP connection timeout interval to 15 seconds (the default is 180 seconds).

Hint: For Solaris only: To make this command persistent (across server reboots), add the command to the /etc/rc2.d/S69inet file in the "Set configurable parameters" section.

Registering for Event Notification

Event notification allows tracking of events occurring in tape libraries for ACSAPI clients. This feature is provided by the CSC Toolkit. Specifically, with event notification, the ACSAPI client can do the following:

- Register for library resource events and/or volume events

- Unregister for these events

- Check registration status for library events and be notified when they occur

Client registration requests and event notification messages are delivered to the client until the registration is dropped. Event notification periodically checks the registration status of the client to verify that the client is alive. This avoids sending responses to clients that are no longer active and avoids the unnecessary use of network resources.

The following types of events can be tracked:

- Addition and deletion of volumes and when maximum usage is exceeded for cleaning cartridges in the ACSLS database.

- Changes in library component status such as an LSM or drive changing from online to offline, diagnostic, or recovery; or a CAP that is opened or closed.

- Hardware failures such as an inoperable robotic hand .

Chapter 10. Cartridge Management

- Using the Manual Volume Delete Utility

- Using Mixed–Media support with 3490E Cartridges

- Using the Absent Cartridge support Feature

- Using the CAP

Using the Manual Volume Delete Utility

The Manual Volume Delete utility, `del_vol`, allows you to obtain a volume that is in an offline, unavailable LSM. If you manually remove the volume from the LSM and try to re–enter it into another LSM, ACSLS will issue a `duplicate volume` message and will not enter the volume. Using the `del_vol` utility, you can first delete the volume from the database, then manually remove it from the offline LSM and successfully re-enter it into an online LSM.

The Manual Volume Delete (del_vol) utility now retains volumes as absent, with the option to delete the volume.   The volume can be deleted without waiting for the expiration of an absent or ejected status.

Note: To remove a volume from an online LSM, issue an eject command for the volume.

For more information about this utility, see "del_vol" in Chapter 13, "Utility Reference".

Note: ACSLS and the database must be up and running to use this utility. Do *not* run del_vol while the system is in recovery; unpredictable results may occur.

➡ **To delete a volume using the del_vol utility, do the following:**

1. Log in as `acsss`.

2. Delete the volume:

   del_vol *vol_id*

   For more information about switch options you can use with `del_vol`, see "del_vol" in Chapter 13, "Utility Reference".

Using Absent and Ejected Cartridge Support

Absent cartridge support in ACSLS marks cartridges that cannot be found in the library absent, instead of deleting them. If these cartridges are later found in the library, ACSLS changes them to active status instead of re–adding them to the database. Reactivation preserves settings, such as pool, volume access control ownership, and locks.

Similarly, ejected cartridge support retains volume information when cartridges are ejected. The cartridges are reactivated when they are re–entered.

Absent and ejected cartridge support is enabled when the ABSENT_VOLUME_RETENTION_PERIOD is set to a non–zero number of days. The default value is 5 days.

Additional aspects of absent and ejected cartridge support include:

- The Manual Volume Delete (del_vol) utility will retain volumes as absent unless the −d option is specified. If this option is specified, the volume is deleted without waiting for the expiration of an absent or ejected status.

- ACSLS improves volume recovery by searching for volumes that are not found in their expected locations in the library. ACSLS searches all recorded locations instead of automatically deleting the volume.

- Clients can specify, through the ENABLE_STATUS_VOLUME_ABSENT and ENABLE_STATUS_VOLUME_MISSING configuration settings, whether they want absent, ejected, and missing statuses to be reported through the ACSAPI.

- The volrpt utility with the −i option will report volume records with a status of absent or ejected. By default, volrpt does not report absent or ejected cartridges.

Absent, Ejected and Missing Cartridges Commands, Utilities and ACSAPI Requests

Cartridge (Volume) Status

ACSLS reports three cartridge (volume) statuses:

- missing

  The volume cannot be located in the library, and at least one recorded location for the volume cannot be searched because the LSM is offline or a drive is not communicating. The information about the volume has been retained.

- absent

  The volume cannot be located in the library. All recorded locations for the volume have been searched, and the volume is not in any of them. The information about the volume is retained. If the volume is found or re–entered into the library (before the retention period expires), it is reactivated.

- ejected

  The volume was ejected. The information about the volume is retained, and if the volume is found or re–entered (before the retention period expires), it is reactivated.

Cartridge (Volume) Status Reporting

ACSLS reports cartridges (volumes) with the status "missing", "absent," or "ejected," differently in response to ACSLS commands than it does in response to ACSAPI requests.

The information displayed in response to ACSLS commands identifies a cartridge as "missing", "absent", or "ejected."

However, the cartridge status information ACSLS displays in response to ACSAPI requests is governed by the following ACSLS dynamic variables:

1. missing

    a. If the ACSLS dynamic variable *ENABLE_STATUS_VOLUME_MISSING* is TRUE, ACSLS reports: *STATUS_VOLUME_MISSING*.

    b. If the ACSLS dynamic variable *ENABLE_STATUS_VOLUME_MISSING* is FALSE, ACSLS reports: *STATUS_VOLUME_IN_TRANSIT*.

2. absent

    a. If the ACSLS dynamic variable *ENABLE_STATUS_VOLUME_ABSENT* is TRUE, ACSLS reports: *STATUS_VOLUME_ABSENT*

    b. If the ACSLS dynamic variable *ENABLE_STATUS_VOLUME_ABSENT* is FALSE, ACSLS treats the volume as if it had been deleted from the ACSLS database and reports: *STATUS_VOLUME_NOT_IN_LIBRARY*.

3. ejected

    a. If the ACSLS dynamic variable *ENABLE_STATUS_VOLUME_EJECTED* is TRUE, ACSLS reports: *STATUS_VOLUME_EJECTED*

    b. If the ACSLS dynamic variable *ENABLE_STATUS_VOLUME_EJECTED* is FALSE, ACSLS treats the volume as if it had been deleted from the ACSLS database and reports: *STATUS_VOLUME_NOT_IN_LIBRARY*.

ABSENT_VOLUME_RETENTION_PERIOD Dynamic Variable

The *ABSENT_VOLUME_RETENTION_PERIOD* dynamic variable controls how long absent and ejected volumes are retained in the ACSLS database and specifies the number of days these volumes are retained. There are two special values:

○ The value 0 (zero) days specifies that volumes are deleted and will not be marked absent or ejected. (This is the behavior of ACSLS releases previous to ACSLS 6.1.)

○ The value 999 days specifies that absent and ejected volumes are retained forever in the database.

Cartridge Recovery

Cartridge Recovery (acscr) is an ACSLS internal process that is called to resolve discrepancies whenever the actual content of a storage cell or tape drive does not match the information saved in the ACSLS database. It does this by having the library examine storage cells and drives, and then updating the ACSLS database with the results. If Cartridge Recovery finds a discrepancy (e.g., a volume that is recorded at another location), it creates another recovery request and adds it to its request queue. (This is called a "cascade".)

Other processes pass recovery requests to Cartridge Recovery when they encounter a discrepancy between the ACSLS database and the actual contents of the library. Because of this, Cartridge Recovery is the central location where cartridges are marked as missing, changed to absent, and reactivated. Thus, what appears to be the behavior of many other ACSLS commands and utilities is actually done by Cartridge Recovery when it updates the database to match the information reported by the library.

When other processes pass recovery requests to Cartridge Recovery, they can either:

1. continue and let Cartridge Recovery continue asynchronously (Cartridge Recovery proceeds independently), or

2. if they need a specific cartridge that ACSLS can't locate, wait for Cartridge Recovery to finish processing this recovery request and report what it found.

Missing Volumes

A cartridge is marked missing when:

- Cartridge Recovery cannot find a volume in the library, and

- it cannot examine all recorded locations for a volume (home cell and drive, if the volume has a recorded drive location).

For example, when Cartridge Recovery cannot examine the home cell in an offline LSM or an offline drive, and when it doesn't find the cartridge in other locations, it marks the cartridge missing.

Cartridge Recovery preserves the cartridge's home location unless it examines the cartridge's home cell and finds another cartridge there. In this situation it marks the cartridge "homeless," with a minus one (–1) in the home_lsm field.

When Cartridge Recovery finds a volume that was missing, it changes that volume's status to "home" or "in drive" in the database, depending where it found the missing volume.

1. If the cartridge is found in a cell other than its recorded home cell, Cartridge Recovery checks the cartridge's home cell to see whether it has found a duplicate volume.

2. If the cartridge is not in its recorded home cell, Cartridge Recovery records the cell in which it was found as its new home cell.

3. If the new cartridge is a duplicate, Cartridge Recovery reports this on the Event Log. The duplicate cartridge is **not** ejected.

4. If Cartridge Recovery finds a "homeless" cartridge in a drive, it does not assign a new home cell. When the cartridge is dismounted, the dismount process assigns a new home cell.

Absent and Ejected Volumes

Cartridges Not Found

When Cartridge Recovery can examine all recorded locations and it cannot find a cartridge:

1. If the *ABSENT_VOLUME_RETENTION_PERIOD* is 0, Cartridge Recovery

   ○ deletes the volume record from the database.

   ○ marks the cell record in the database for the cell that was the volume's home cell as "empty."

2. If the *ABSENT_VOLUME_RETENTION_PERIOD* is greater than 0, Cartridge Recovery

   ○ changes the status of the volume record in the database to "absent" if the volume has not already been marked absent or ejected.

   ○ records the volume as "homeless" (with a minus one (–1) in the home_lsm field).

   ○ marks the cell record in the database of the volume's former home cell as "empty."

Cartridges Found

If Cartridge Recovery finds an ejected or absent volume, it reactivates the volume.

If the ejected or absent volume is found in a storage cell, this becomes its new home cell, and Cartridge Recovery changes the volume's status to "home" in the database.

If the volume is found in a drive, ACSLS assigns a new home cell when the cartridge is dismounted.

Populating the LSM

An essential requirement for the library and ACSLS to function properly is the availability of a few free cells in each LSM to accommodate dismount, passthrough, and eject operations. You should reserve at least one free cell for each tape drive installed in each LSM.

To determine the free cell count of an LSM, issue the command:

```
query lsm lsm_id
```

Using the CAP

CAP Types

Each type of CAP has a standard capacity and method for loading it with cartridges. An LSM may have more than one type of CAP. Table 19. shows the supported CAP types, identifiers and capacities, and loading methods.

Table 19. CAP Types

CAP Type	Identifier & Capacity	Loading Method
Standard	CAP00; holds 21 cartridges.	Cartridges are loaded directly into the CAP cells.
Enhanced (4410 and 9310)	CAP00 and CAP01; each holds 40 cartridges.	Cartridges are placed into removable magazines which are loaded into the CAP.
9360	CAP00 holds 20 cartridges; optional CAP01 holds 30 cartridges.	Cartridges are placed into removable magazines which are loaded into the CAP.

Table 19. CAP Types

CAP Type	Identifier & Capacity	Loading Method
Priority (PCAP)	CAP02; holds one cartridge.	Cartridges are entered one at a time, directly into the CAP.
9710 or 9740 CAP	CAP00, holds 14 cartridges or magazine, which holds 10 cartridges.	Cartridges are loaded directly into the CAP cells or placed into the removable magazine which is loaded into the CAP.
9714, 9730, or 9738 CAP	CAP00, holds one cartridge	Cartridges are loaded directly into the single-cell CAP.
L180	CAP00, holds 10 cartridges.	5 cartridges are placed into each of 2 removable magazines which are loaded into the CAP.
L700	CAP00 and optional CAP01; each holds 20 cartridges.	5 cartridges are placed into each of 4 removable magazines which are loaded into the CAP.

CAP States   A CAP's state determines whether it is available for entering and
ejecting cartridges. Table 20. describes the valid CAP states.
See "Displaying CAP Information" on page 238 for procedures
for determining the CAP state. See the <u>vary</u> command on page
498 for information about changing device states.

Table 20. CAP States

State	Description	How requests are handled
diagnostic	The CAP is available for diagnostic activity without interference from client applications.	• Requests from client applications are rejected. • Requests from the cmd_proc are processed.
offline	The CAP is logically disabled.	• All requests are rejected.
offline-pending	Transition state. Occurs when the CAP is taken from online to offline.	• All new requests are rejected. • Current and pending requests are processed to completion.
online	Normal operating state.	• All requests are accepted and processed.
recovery	Transition state. Occurs when the CAP is taken from offline to online.	• New requests are rejected.

CAP Modes   The CAP mode controls how a CAP will be used for cartridge enters and ejects. Table 21. describes the valid CAP modes. See "Displaying CAP Information" on page 238 for procedures for determining the CAP mode. See the `set cap mode` command on page 471 for information about changing the CAP mode.

Hint: You cannot change a CAP's mode while the CAP is in use. That is, if the door is open during either manual or automatic enter operations, you cannot change its mode until you complete the enter operation.

Table 21. CAP Modes

Mode	Description	Effects on enter/eject
automatic	The CAP is unlocked when not in use. This is the initial mode for all priority CAPs.	• You can enter cartridges without explicitly issuing an `enter` command. The enter is initiated when you open the CAP door, place the cartridge(s) inside, and close the CAP. • To eject cartridges you must explicitly issue an `eject` command. You can either specify the *cap_id* on the command or allow ACSLS to automatically select a CAP, based on previously defined CAP priorities.
manual	The CAP is locked when not in use. This is the initial mode for all multi-cartridge CAPs.	• You can enter or eject cartridges only after explicitly issuing a command. You either specify the *cap_id* on the command, or allow ACSLS to automatically select a CAP, based on previously defined CAP priorities.
Note: Some client applications require CAPs to be in manual mode. See the documentation for your tape management system.		

CAP Priorities   CAP priorities specify how ACSLS automatically selects CAPs
                       when the CAP request specifies an asterisk (*) for the CAP ID.
                       Table 22. describes the CAP priorities and their effect. See
                       "Displaying CAP Information" on page 238 for procedures for
                       determining the CAP priority. See the <u>set</u> <u>cap</u> <u>pri</u>ority
                       command on page 474 for information about changing the CAP
                       priority.

Table 22. CAP Priorities

Priority	Effect
16 (highest)	first used
15 (next highest)	next used
. . .	
1 (lowest)	last used
0	never automatically selected (initial priority for all CAPs)

CAP priorities and automatic CAP selection apply to the
following commands:

- <u>au</u>dit

- <u>ej</u>ect

- <u>en</u>ter

- <u>ve</u>nter

When you enter any of these commands with an asterisk (*) as
the *cap_id*, ACSLS automatically selects an available CAP with
highest non–zero priority for each ACS specified in the request.

Displaying CAP
Information

Following are some guidelines for using the query cap command to display current CAP information.

⇨ **To display information for selected CAPS, enter:**

query cap *cap_id cap_id* ...

⇨ **To display information for all CAPS in the library, enter:**

query cap all

Figure 39 shows a typical example of the results of a query cap command.

```
ACSSA> query cap 0,0,0 0,0,1 0,1,0

1998-06-30 13:15:46              CAP Status
Identifier    Priority    Size  State       Mode        Status

0,0,0         1           21    online      automatic   enter
0,0,1         0           40    online      manual      eject
0,1,0         7           21    offline     automatic   available
```

Figure 39. Example of Query CAP command

Loading a CAP   Use these procedures to load cartridges into different types of CAPs that are in automatic or manual mode. For information about the order in which you load cartridges in CAPs for virtual enters, see procedures for:

- Serial–attached LSMs on page 248

- SCSI–attached LSMs on page NO TAG

Hint: For 4410, 9310, and 9360 CAPs, insert cartridges into CAP cells so that:

- The leader block is to the top and away from you,

- The customer label is on your left, and

- The tri-optic label is facing you.

For 97*xx* CAPs, insert cartridges into CAP cells so that:

- The manufacturer's label is facing up

- The cartridge volume serial number label is facing you and reads left to right.

Caution: For 4410 and 9310 CAPs, do not skip cells. The robot stops scanning for cartridges if it finds an empty CAP cell. Therefore, any cartridges you place after an empty cell will not be entered into the library.

Loading a Standard CAP (4410 or 9310 LSM)

Use this procedure to load a standard CAP.

➡ **To load a standard CAP, do the following:**

1. Start with the cell at the top left.
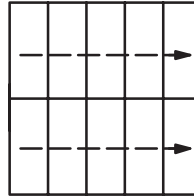
2. Insert cartridges from left to right, top to bottom.

3. Fill each row completely before beginning with the next.

Loading an
Enhanced CAP
(4410, 9310, or
9360 LSM)

Use this procedure to load an enhanced CAP.

⇨   **To load an enhanced CAP, do the following:**

1. Insert cartridges in magazine:

   ○   4410 and 9310—from top to bottom.
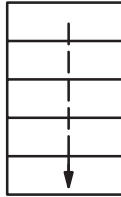
   ○   9360—anywhere in magazine.

2. Load magazines in CAP, from bottom to top.
   All magazines you place in the CAP, except the
   bottom one, must be full.
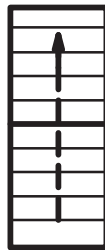
   Caution: Do not leave empty slots between
   magazines, which will cause the robot to stop
   scanning for cartridges.

Loading a Priority
CAP (4410, 9310,
or 9360 LSM)

Use this procedure to load a priority CAP (PCAP).

➡ **To load a priority PCAP, insert cartridges one at a time through the CAP door.**

Loading a 9710 or
9740 CAP

Use this procedure to load a 9710 or 9740 CAP.

➡ **To load a 9710 or 9740 CAP, do the following:**

1. Start with the cell at the top.

2. Insert cartridges from top to bottom.

   You can skip cells if you are not doing a virtual enter.

Loading a Magazine
in a 9710 or 9740
CAP

Use this procedure to load a magazine in a 9710 or 9740 CAP.

➡ **To load a magazine in a 9710 or 9740 CAP, do the following:**

1. Insert cartridges in magazine from top to bottom anywhere in the magazine.

2. Load the magazine in the CAP.

Loading a 9714,
9730, or 9738 CAP

You can load only one cartridge in a 9714, 9730, or 9738 CAP, which is a single cell CAP.

Loading a Magazine in an L180 or L700 CAP

Use this procedure to load a magazine in an L180 or L700 CAP.

⇨ **To load a magazine in an L180 or L700 CAP, do the following:**

1. Insert cartridges anywhere in the magazine.

2. Load the magazine anywhere in the CAP.

Entering Cartridges

The following sections contain automatic mode, manual mode, and virtual enter procedures for serial–attached and SCSI–attached LSMs. See "Loading a CAP" on page 239 for procedures for loading different types of CAPs.

Hint: If volume tracing is enabled, the event log records all volume enters. For more information, see "Planning ACSLS Configuration Options".

Entering Cartridges in Automatic Mode (Serial–Attached LSMs)

For serial–attached LSMs, use this procedure to set the CAP mode to automatic and enter cartridges.

If you set a CAP to automatic mode, another process can temporarily lock the CAP while you are trying to use it to enter cartridges.

➡ **To enter cartridges in automatic mode, do the following:**

1. To make the CAP ready, enter:

    set cap mode automatic *cap_id*

    where *cap_id* is the identifier of the CAP used to enter cartridges. The CAP will remain in automatic mode until you set its mode to manual.

2. When the operator panel displays `ONLINE CAP UNLOCKED`, open the CAP.

🛑 STOP

    Warning: Do not try to reach beyond the CAP into the LSM.

3. Place the cartridges into the CAP.

4. Close the CAP.

    The lock automatically engages.

    Caution: Do not slam the CAP door or cartridges may fall on the floor.

5. Did any cartridges have unreadable or duplicate external labels?

YES	The robot will leave them in the CAP. When the CAP unlocks, open the CAP and remove these cartridges.
NO	Continue with Step 6.

6. Do you want to enter more cartridges?

YES	Return to Step 2.
NO	The CAP is in automatic enter mode. To set the CAP enter mode to manual, enter **set cap mode manual** *cap_id*.

See Also

- Entering Cartridges in Manual Mode (Serial–Attached LSMs), page 246

- Cancelling an Enter Request,

- CAP Modes, page 236

**Entering
Cartridges in
Manual Mode
(Serial–Attached
LSMs)**

For serial–attached LSMs, use this procedure to set the CAP
mode to manual and enter cartridges.

To enter cartridges in manual mode, do the following:

1. To make the CAP ready, enter:

   enter *cap_id*

   where *cap_id* is the identifier of the CAP used to enter
   cartridges.

2. When the operator panel displays ONLINE CAP UNLOCKED,
   open the CAP.

   STOP

   Warning: Do not try to reach beyond the CAP into the
   LSM.

3. Place the cartridges into the CAP.

4. Close the CAP.

   The lock automatically engages.

   Caution: Do not slam the CAP door or cartridges may
   fall on the floor.

5. Did any cartridges have unreadable or duplicate external
   labels?

YES	The robot will leave them in the CAP. When the CAP unlocks, open the CAP and remove these cartridges.
NO	Continue with Step 6.

6. Do you want to enter more cartridges?

YES	Return to Step 1 .
NO	Wait until the CAP is unlocked and then press ⟦CTRL⟧ + C to terminate the enter operation.

See Also

- Entering Cartridges in Automatic Mode (Serial–Attached LSMs).

- CAP Modes, page 236

- Cancelling an Enter Request

4. Close the CAP.

The lock automatically engages.

Caution: Do not slam the CAP door or cartridges may fall on the floor.

5. Do you want to enter more cartridges?

YES	Return to Step 1.
NO	This concludes this procedure.

See Also

- CAP Priorities, page 237

- Displaying CAP Information, page 238

- Specifying volume IDs, page 362

- Entering Cartridges in Manual Mode (Serial–Attached LSMs), page 246

- Cancelling an Enter Request.

- CAP Modes, page 236

Entering Cartridges in Automatic Mode (SCSI–Attached LSMs)

For SCSI–attached LSMs, use this procedure to set the CAP mode to automatic and enter cartridges.

If you set a CAP to automatic mode, another process can temporarily lock the CAP while you are trying to use it to enter cartridges.

⇨ **To enter cartridges in automatic mode, do the following:**

1. To make the CAP ready, enter:

   `set cap mode automatic` *cap_id*

   where *cap_id* is the identifier of the CAP used to enter cartridges. The CAP will remain in automatic mode until you set its mode to manual.

   For 97xx LSMs, continue with Step 2. For L180 LSMs, go to Step 3. For L700 LSMs, go to Step 4.

2. For 97xx LSMs, when the operator panel displays ONLINE PRESS EXEC TO UNLK CAP, press ⟦EXEC⟧ on the operator panel above the CAP.

   When the operator panel displays ONLINE CAP UNLOCKED, open the CAP door by swiveling it outward.

   STOP

   Warning: Do not try to reach beyond the CAP into the LSM.

3. For L180 LSMs, press the ⟦CAP⟧ button on the operator panel to open the CAP.

   The OPEN indicator will light.

4. For L700 LSMs, press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to open the CAP.

   The OPEN indicator will light.

5. Place the cartridges into the CAP.

   For 97xx LSMs, continue with Step 6. For L180 LSMs, go to Step 7. For L700 LSMs, go to Step 8.

---

6. Close the CAP by swiveling it inward until you hear a click.

   The lock automatically engages.

   Caution: Do not slam the CAP door or cartridges may fall on the floor.

7. Press the ⟦CAP⟧ button on the operator panel to close the CAP

8. Press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to close the CAP.

9. Did any cartridges have unreadable or duplicate external labels?

YES	The robot will leave them in the CAP. When the CAP unlocks, open the CAP and remove these cartridges.
NO	Continue with Step 10.

10. Do you want to enter more cartridges?

YES	Return to Step 2. or Step 3.
NO	The CAP is in automatic enter mode. To set the CAP enter mode to manual, enter **set cap mode manual** *cap_id*.

See Also

- Entering Cartridges in Manual Mode (SCSI–Attached LSMs).

- Cancelling an Enter Request.

- CAP Modes, page 236

**Entering
Cartridges in
Manual Mode
(SCSI–Attached
LSMs)**

For SCSI–attached LSMs, use this procedure to set the CAP mode to manual and enter cartridges. If the operator panel displays an ONLINE CAP UNLK DISABLD message, the CAP is locked by the host. Use the following procedure to unlock the CAP and load cartridges.

To enter cartridges in manual mode, do the following:

1. To make the CAP ready, enter:

   enter *cap_id*

   where *cap_id* is the identifier of the CAP used to enter cartridges.

   For 97xx LSMs, continue with Step 2. For L180 LSMs, go to Step 3. For L700 LSMs, go to Step 4.

2. For 97xx LSMs, when the operator panel displays ONLINE PRESS EXEC TO UNLK CAP, press ⟦EXEC⟧ on the operator panel above the CAP door.

   When the operator panel displays ONLINE CAP UNLOCKED, open the CAP door by swiveling it outward.

   STOP

   Warning: Do not try to reach beyond the CAP into the LSM.

3. For L180 LSMs, press the ⟦CAP⟧ button on the operator panel to open the CAP.

   The OPEN indicator will light.

4. For L700 LSMs, press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to open the CAP.

   The OPEN indicator will light.

5. Place the cartridges into the CAP.

   For 97xx LSMs, continue with Step 6. For L180 LSMs, go to Step 7. For L700 LSMs, go to Step 8.

6. Close the CAP by swiveling it inward until you hear a click.

   The lock automatically engages.

   Caution: Do not slam the CAP door or cartridges may fall on the floor.

7. Press the ⟦CAP⟧ button on the operator panel to close the CAP.

8. Press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to close the CAP.

9. Did any cartridges have unreadable or duplicate external labels?

YES	The robot will leave them in the CAP. When the operator panel displays CAP LOCKED, press ⟦EXEC⟧, ⟦CAP⟧, ⟦CAP A⟧, or ⟦CAP B⟧ to unlock the CAP and remove these cartridges.
NO	Continue with Step 10.

10. Do you want to enter more cartridges?

YES	Return to Step 1.
NO	Press ⟦CTRL⟧ + C to terminate the enter operation.

See Also

- Entering Cartridges in Automatic Mode (SCSI–Attached LSMs).

- CAP Modes, page 236

- Cancelling an Enter Request.

Entering Cartridges with Virtual Labels (SCSI–Attached LSMs)

For SCSI–attached LSMs, use this procedure to enter cartridges with missing or unreadable external labels and assign virtual labels to them.

Cautions:

- ACSLS does *not* support the <u>ve</u>nter command for SCSI-attached LSMs when either:

  ○ The cartridge being ventered does *not* have a media label.

  ○ The cartridge's media label is not compatible with any drives attached to the SCSI library.

- Use the <u>ve</u>nter command to enter cartridges with missing or unreadable labels. Do *not* open the LSM door and place cartridges with missing or unreadable labels in a storage cell because ACSLS cannot manage these cartridges. During an audit, ACSLS will eject volumes with missing or unreadable labels and no virtual labels.

- The <u>ve</u>nter command does not provide an option to specify the media type of the cartridge you want to enter. In a mixed-media environment, ACSLS cannot prevent transport/media incompatibilities for virtually entered cartridges!

➪ **To enter cartridges with virtual labels, do the following:**

1. To make the CAP ready, enter:

   venter *cap_id vol_id vol_id*

   Where *cap_id* is the identifier of the CAP used to enter cartridges and the *vol_id*s are the virtual labels of the cartridges you want to enter.

   For 97xx LSMs, continue with Step 2. For L180 LSMs, go to Step 3. For L700 LSMs, go to Step 4.

2. For 97xx LSMs, when the operator panel displays `ONLINE PRESS EXEC TO UNLK CAP`, press ⟦EXEC⟧ on the operator panel above the CAP door.

   When the operator panel displays `ONLINE CAP UNLOCKED`, open the CAP door by swiveling it outward.

   STOP

   Warning: Do not try to reach beyond the CAP into the LSM.

3. For L180 LSMs, press the ⟦CAP⟧ button on the operator panel to open the CAP.

   The `OPEN` indicator will light.

4. For L700 LSMs and L700e libraries, press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to open the CAP.

   The `OPEN` indicator will light.

5. Place the cartridges into the CAP.

   Caution: The order in which you place the cartridges in the CAP from top to bottom must match the order of the *vol_id*s in the <u>venter</u> command from left to right in Step 1. Do not skip CAP cells; the robot will not scan for any cartridges you place after after an empty CAP cell. See "Loading a CAP" on page 239 for more information about loading different types of CAPs.

   For 97xx LSMs, continue with Step 6. For L700 and L700e LSMs, go to Step 7. For L700 LSMs, go to Step 8.

6. Close the CAP by swiveling it inward until you hear a click.

   The lock automatically engages.

   Caution: Do not slam the CAP door or cartridges may fall on the floor.

7. Press the ⟦CAP⟧ button on the operator panel to close the CAP.

8. Press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to close the CAP.

9. Do you want to enter more cartridges?

YES	Return to Step 1.
NO	This concludes this procedure.

See Also

- CAP Modes, page 236

- CAP Priorities, page 237

- Displaying CAP Information, page 238

- Entering Cartridges in Manual Mode (SCSI–attached LSMs).

- Specifying volume IDs, page 362

Cancelling an Enter Request

Use this procedure to cancel a current or pending enter or virtual enter request.

☞   To cancel an enter request, do the following:

1. To display all current and pending library activity, enter:

   query request all

2. Note the *request_id* of the enter/venter request you want to cancel.

3. From a cmd_proc, enter:

   cancel *request_id*

   where *request_id* is the identifier of the request you want to cancel.

4. Wait for the CAP to unlock, then remove all cartridges left in it.

   Hint: For 97*xx* CAPs, wait until the operator panel displays ONLINE CAP LOCKED, then press ⟦EXEC⟧ on the operator panel above the CAP door and open the CAP by swiveling the CAP door outward.

   For L180 CAPs, press ⟦CAP⟧ on the operator panel above the CAP door.

   For L700 CAPs, press ⟦CAP A⟧, or ⟦CAP B⟧ on the operator panel above the CAP door.

   The cmd_proc will display a message indicating the number of cartridges entered into the library before the cancel request was received. These cartridges will remain under ACSLS control.

See Also

- `query` `request` command, page 460

Ejecting Volumes

The following sections tell how to eject volumes from the library.

Hint: If volume tracing is enabled, the event log records all volume ejections. For more information, see "Planning ACSLS Configuration Options" .

Ejecting Volumes (Serial–Attached LSMs)

For serial–attached LSMs, use this procedure to eject volumes from the library.

Hint: If you are ejecting volumes through an enhanced CAP, it must contain at least one magazine.

➡ **To eject volumes, do the following:**

1. To fill the CAP with the volumes you want to eject, enter:

   eject *cap_id vol_id volrange* **...**

   where *cap_id* is the identifier of the CAP used to eject volumes and the *vol_id*s or *volrange*s specify the volumes you want to eject. You can use a single eject command to eject multiple volumes not in a range by specifying multiple volume IDs separated by a space.

   When the operator panel displays ONLINE CAP UNLOCKED, continue with Step 2.

2. Open the CAP.

   STOP

   Warning: Do not try to reach beyond the CAP into the LSM.

3. Remove the cartridges from the CAP.

4. Close the CAP by swiveling it inward until you hear a click.

   The lock automatically engages.

   Caution: Do not slam the CAP door or cartridges may fall on the floor.

5. If you want to eject more volumes, return to Step 1. Otherwise, this concludes this procedure.

See Also

- CAP Modes, page 236
- CAP Priorities, page 237
- Eject command, page 394
- Displaying CAP Information, page 238

Ejecting Volumes (SCSI–Attached LSMs)

For SCSI–attached LSMs, use this procedure to eject volumes from the library.

➪ **To eject volumes, do the following:**

1. To fill the CAP with the volumes you want to eject, enter:

   eject *cap_id vol_id volrange* **...**

   where *cap_id* is the identifier of the CAP used to eject volumes and the *vol_id*s or *volrange*s specify the volumes you want to eject. You can use a single eject command to eject multiple volumes not in a range by specifying multiple volume IDs separated by a space.

   For 97xx LSMs, when the operator panel displays ONLINE PRESS EXEC TO UNLK CAP, continue with Step 2.

   For L180 and L700 LSMs, go to Step 3.

2. To unlock the CAP, press ⟦EXEC⟧ on the operator panel above the CAP door.

   STOP

   Warning: Do not try to reach beyond the CAP into the LSM.

3. To unlock the CAP, press ⟦CAP⟧, ⟦CAP A⟧, or ⟦CAP B⟧ on the operator panel above the CAP door.

4. Remove the cartridges from the CAP.

   For 97xx LSMs, when the operator panel displays ONLINE PRESS EXEC TO UNLK CAP, continue with Step 5.

   For L180 LSMs, go to Step 6.

   For L700 LSMs, go to Step 7.

5. For 97xx LSMs, close the CAP.

   The lock automatically engages.

6. Press the ⟦CAP⟧ button on the operator panel to close the CAP.

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7. Press the ⟦CAP A⟧ or ⟦CAP B⟧ button on the operator panel to close the CAP.

8. If you want to eject more volumes, return to Step 1.

   Otherwise, this concludes this procedure.

See Also

- CAP Modes, page 236

- CAP Priorities, page 237

- Eject command, page 394

- Displaying CAP Information, page 238

Managing Scratch Volumes

Scratch volumes either contain no data or data that can be overwritten. A user or application mounts a scratch volume to write new data on that volume.

You must ensure that the library has enough available scratch volumes to satisfy scratch mount requests. For more information see:

- "Adding Scratch Volumes to the Library".

- "Rebalancing Scratch Pools".

The following sections provide additional information about managing scratch volumes and scratch pools:

- "Displaying Scratch Pool and Scratch Volume Information".

- "Deleting Scratch Pools".

- "Mounting Scratch Volumes" in single-media and mixed-media environments.

- "Unscratching Volumes" that were scratched in error.

Displaying Scratch Pool and Scratch Volume Information

To display scratch pool information, use the following ACSLS functions:

`query pool` **command**

> Displays scratch pool attributes, page 455.

`query scratch` **command**

> Displays scratch volume information, page 462.

`query mount *` **command**

> Displays the status of media-compatible transports for a specified scratch pool (and, optionally, for a specific volume media type within the pool), page 452.

customized volume report

> Can be created to report selected scratch volume information, page 316.

Adding Scratch Volumes to the Library

Use this procedure to add scratch volumes to the library.

➡ **To add scratch volumes to the library, do the following:**

1. If necessary, create a new scratch pool:

   For more information, see the `define pool` command on page 383.

2. Enter scratch cartridges into the library.

   For more information, see "Entering Cartridges" above.

3. Define the cartridges you entered in Step 2 as scratch volumes and assign them to a scratch pool.

   For more information, see the `set scratch` command on page 483.

Rebalancing Scratch Pools

Use this procedure to rebalance scratch pools by moving scratch volumes from one pool to another.

➡ **To rebalance scratch pools, do the following:**

1. To display the attributes of all scratch pools, enter:

   `query pool all`

   For more information see the query pool command on page 455.

2. Use the query scratch command to display the IDs of scratch volumes in pools you want to rebalance.

   For more information, see the query scratch command on page 462.

3. Use the set scratch command to move scratch volumes from one pool to another.

   For example, to move volumes YUMA20 through YUMA80 (which currently reside in pool 5) to pool 10, enter:

   `set scratch 10 YUMA20-YUMA80`

   For more information, see the set scratch command on page 483.

**Deleting Scratch
Pools**

To manage scratch pools, you may want to delete any scratch
pools that no longer contain scratch volumes. You cannot delete
the common pool (Pool 0). Note that you can delete only empty
scratch pools; you cannot delete a scratch pool if it contains
either data or scratch volumes. You can, however, use the
procedure on page 268 to delete all empty pools (ACSLS will
not delete any pools that contain scratch or data volumes).

Emptying a Scratch
Pool

Use this procedure to empty a scratch pool before deleting it.

To empty a scratch pool, do the following:

1. To move data volumes out of the pool, enter:

   `set scratch off 0` *vol_id volrange* `...`

   Where the *vol_id*s or *volrange*s specify the data volumes
   you want to move to the common pool (pool 0). For more
   information, see the set scratch command on page 483.

2. To move scratch volumes out of the pool, do one of the
   following:

   ○ Move the volumes to another pool.

   ○ Eject the volumes, page 259. If you eject scratch
     volumes, however, ACSLS no longer manages these
     volumes. If you later want to use these volumes, you
     must reenter them and assign them to a scratch pool.

Deleting a Single
Pool

➪ **To delete a single pool, enter:**

    `delete pool` *pool_id*

Deleting All Empty
Pools

The <u>delete</u> <u>poo</u>l <u>al</u>l command deletes only empty scratch
pools, not pools that contain scratch or data volumes.

➪ **To delete all empty pools, enter:**

    `delete pool all`

**Mounting Scratch
Volumes**

Use the following procedures to mount scratch volumes in
single-media and mixed-media environments..

Single-Media
Environments

➪ **To mount a volume from a specified pool, enter:**

`mount *` *drive_id pool_id*

Hint: If no volume is available from the specified pool and the
pool has been set for "overflow," ACSLS will select a volume
from the common pool (pool 0).

➪ **To mount a volume from the common pool, enter:**

`mount *` *drive_id*

Mixed-Media
Environments

⇨ **To mount a scratch volume with a specified media
type from a specified pool , enter:**

mount * *drive_id pool_id* <u>me</u>dia *media_type*

Hint: If no volume is available from the specified pool and the
pool has been set for <u>ov</u>erflow ACSLS will select a volume
with the specified media type from the common pool (pool 0).

⇨ **To mount a scratch volume from a specified pool with
a media type determined by scratch preferences,
enter:**

mount * *drive_id pool_id* <u>me</u>dia *

Hint: If no volume is available from the specified pool and the
pool has been set for <u>ov</u>erflow ACSLS will select a volume
from the common pool (pool 0) according to the defined scratch
preferences.

⇨ **To mount a volume from the common pool with a specified
media type, enter:**

mount * *drive_id* <u>me</u>dia *media_type*

⇨ **To mount a volume from the common pool with a media
type determined by scratch preferences, enter:**

mount * *drive_id* <u>me</u>dia *

See Also

- <u>mo</u>unt <u>*</u> command, page 418

- <u>q</u>uery commands, page 429

- Setting Scratch Preferences, page 212

Unscratching Volumes

Use this procedure to "unscratch" volumes (return them to data volume status) that were scratched in error.

➡ **To unscratch volumes:**

1. Use the query pool and query scratch commands to display the volume and pool IDs of the volumes to unscratch.

   For more information see the query pool command on page 455 and the query scratch command on page 462.

2. To unscratch the selected volumes, enter:

   set scratch off 0 *vol_id volrange* **...**

   Where the *vol_id*s or *volrange*s specify the volumes you want to unscratch and move to the common pool (pool 0). For more information, see the set scratch command on page 483.

Cleaning Transports

Transports must be cleaned periodically to prevent damage to them and the tape media. Transport control units track how much tape passes through each transport and send a message to ACSLS when a transport requires cleaning. If auto-cleaning is enabled, ACSLS automatically mounts a cleaning cartridge on the transport when required. If all cleaning cartridges are expired (the *max_usage* value is exceeded), ACSLS honors the original mount request without cleaning the transport. For that mount and for each subsequent mount to the uncleaned drive, ACSLS posts message 376N to the event log. Add more cleaning cartridges of compatible media with the drive type as described in "Defining Cleaning Cartridges" on page 272.

If auto-cleaning is disabled, ACSLS logs a message in the event log and displays cleaning messages at the cmd_proc when the transport requires cleaning. You then must manually mount a cleaning cartridge.

You use the acsss_config configuration program to enable or disable auto-cleaning. acsss_config also lets you specify how cleaning cartridges are ordered for selections and queries. For more information, see "Chapter 7: Configuring your Library Hardware".

The following sections tell how to do the following:

- Define cleaning cartridges to ACSLS

- Eject used cleaning cartridges

- Manually clean a transport

- Clean a transport attached to a SCSI-attached LSM

- Correct cleaning cartridge problems

Defining Cleaning Cartridges

You must use the <u>set</u> <u>clean</u> command to define a cleaning cartridge because ACSLS does not define cleaning cartridges by *vol_id*.

When you define cleaning cartridges, make sure to:

- Use cleaning cartridges whose media types are compatible with each transport type in your library. ACSLS will automatically select the correct type of cartridge for each cleaning operation.

- Define at least one cleaning cartridge for each transport in your library.

➪ **To define cleaning cartridges to ACSLS, do the following:**

1. Make the CAP ready for entry.

   See "Entering Cartridges" for more information.

2. Enter the cleaning cartridges.

   The cmd_proc displays messages with the volume IDs of the cartridges you enter.

3. To set the cleaning cartridge attribute:

   set clean *max_usage vol_id|volrange*

   Where:

   > *max_usage* is the number of times a cleaning cartridge is used before ACSLS stops selecting the cartridge to clean transports.

   > *vol_id|volrange* specifies the cleaning cartridge or range of cartridges that you entered in Step 2.

See Also

- <u>en</u>ter command, page 400

- <u>set</u> <u>clean</u> command, page 477

- <u>q</u>uery <u>clean</u> command, page 436

- volrpt utility,

Ejecting Used Cleaning Cartridges

ACSLS logs a message to the event log when a cleaning cartridge has reached the maximum use specified on the <u>set</u> <u>clean</u> command. ACSLS leaves the cartridge in the library, but will no longer select it for cleaning. Eject the used cleaning cartridge and enter a replacement.

➡️ **To eject used cleaning cartridges, do the following:**

1. To eject the cleaning cartridges, enter:

   eject *cap_id vol_id|volrange*

   Where**:**

   > *cap_id* specifies the CAP used to eject the cleaning cartridges.

   > *vol_id|volrange* specifies the IDs of the cleaning cartridges to eject.

2. Remove the cleaning cartridges.

See Also

- <u>q</u>uery <u>clean</u> command, page 436

- <u>e</u>ject command, page 394

- volrpt utility,.

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**Manually Cleaning
a Transport**

ACSLS logs a message in the event log and displays a message at the cmd_proc when a transport needs cleaning. Use this procedure to clean a transport if auto-cleaning is disabled.

☞   **To manually clean a transport, do the following:**

1. Display the available cleaning cartridges:

    query clean all

2. Mount a cleaning cartridge on the transport:

    mount *vol_id drive_id*

3. After the transport is cleaned and the cleaning cartridge is unloaded, dismount the cleaning cartridge:

    dismount *vol_id drive_id*

See Also

- query clean command, page 436

- mount command, page 413

- dismount command, page 389

Cleaning Transports on SCSI-Attached LSMs

You cannot use the `acsss_config` configuration program to enable auto-cleaning for drives attached to SCSI-attached LSMs. Using ACSLS, you can only clean these drives by manually mounting a cleaning cartridge. The LSM hardware, however, lets you enable auto–cleaning via the LSM control panel. For more information, see your LSM documentation. For 9714, 9730, or 9738 LSMs, if you either enable or disable auto-cleaning via the control panel, for the change to take effect you must do the following:

- Stop ACSLS; see "Stopping ACSLS" on page 7.

- Rerun `acsss_config` without changing any options but ensuring that you enter Y to the `Build/verify library configuration?` prompt; see "How to Do a Reconfiguration".

- Restart ACSLS; see "Restarting ACSLS" on page 6.

Correcting Cleaning Cartridge Problems

The following procedures tell how to:

- Change a cleaning cartridge's maximum use count. For example, if the manufacturer recommends that you use a cartridge only 10 times and you set *max_usage* to 20, reset *max_usage* to 10 if the cartridge is unused. If the cartridge was used five times, reset *max_usage* to 5.

- Set a volume's cleaning cartridge attribute off. For example, if you incorrectly defined a data volume as a cleaning cartridge, set the volume's cleaning cartridge attribute off to redefine the volume as a data volume.

▷ **To change a cleaning cartridge's maximum use count, enter:**

  `set clean` *max_usage vol_id|volrange*

  Where:

  max_usage is the the new maximum use.

  vol_id|volrange specifies the cleaning cartridge or range of cartridges.

➡️ **To set a volume's cleaning cartridge attribute off, enter:**

`set clean off` *vol_id* | *volrange*

Where *vol_id* | *volrange* specifies the volume or range of volumes.

Manually Loading Volumes Into Drives In a Disabled LSM

If your LSM fails and you take it off line, you can still manually load volumes into the library drives if the data path is still operational.

➪ **To manually load volumes into drives in a disabled LSM, do the following:**

1. Open the LSM door.

2. Note the volume labels of any cartridges that are already in drives and remove these volumes.

   You will need to replace these volumes at the end of this procedure.

3. Load the drives with the volumes you want to read from or write to.

   Repeat this step as often as necessary until the LSM is repaired, then continue with Step 4.

   Caution: In this step, you can remove volumes from library cells and load these volumes in the drives. Note the cell locations of these volumes and ensure that you return the volumes to these locations in Step 4.

4. After the LSM is repaired, remove all volumes from the drives and replace them with the original volumes you noted in Step 2.

5. Close the LSM door, vary the LSM back online, and resume normal operations.

Chapter 11. Database Backup and Restore

This chapter discusses: Importing and Exporting the database;
verifying the imported database and library configuration;
Backing up the database; and Restoring and Recovering the
database.

- Exporting and Importing the database includes:

  - Exporting the database to a disk file or tape

  - Importing the database from a disk file or tape

  - Verifying the imported database and library
    configuration

- Backing up the database includes:

  - Automatic database backup

  - Performing manual backups to tape or disk

  - Backing up to the default tape device attached to the
    ACSLS server

  - Backing up to a specified tape device attached to the
    ACSLS server

  - Backing up to a UNIX File

  - Backing up and restoring to another server

- Recovering and Restoring the database includes:

  - Restoring the database to the most recent backup

- ○ Restoring the database to a specified date and time

- ○ Recovering from a primary disk failure

- ○ Recovering from a second disk failure

- ○ Recovering from a failed server

- ○ Recovering from a specific archived file

- ○ Restoring miscellaneous ACSLS files

- Restarting the Database

You should use the backup and restore utilities for your daily backups and to recover the database. Use the export and import utilities if you are migrating (going to a later release or going to a previous release).

When you install ACSLS, you also automatically install the database management software. The database is initialized when you configure the library hardware or when you import data via db_import.sh. The database contains all information about the library configuration and the location of all library volumes.

The following attributes are imported into the new database when you use the db_import.sh utility.

- Volumes: These database tables include all of the information associated with each volume in the library, such as:

  - ○ where the volume resides

  - ○ type of volume (data, scratch, cleaning, etc.)

  - ○ last associated scratch pool

  - ○ current status of the volume (home, mounted, etc.)

  - ○ entry date and last accessed date

  - ○ number of mounts since the entry date

  - ○ maximum use (for cleaning volumes)

- ○ associated lock id and user id (if the volume is locked)

- ACS and Library: database tables include the ACSs and library components, such as: LSMs, drives, panels, cells

- Miscellaneous: files include all configuration updates since the initial installation, including:

  - ○ access control information

  - ○ fixed volume preferences

  - ○ scratch media preferences

  - ○ custom volrpt templates

Dynamic and static variables are only imported when they are imported into the same ACSLS release from which they were exported. When importing data into a different ACSLS release, use `acsss_config` to re–set any custom dynamic and static variables.

Exporting the Database

This section describes how to migrate the the information in the database from a previous release of ACSLS to ACSLS 6.1 or later, or to go back to a prior release. The db_export.sh utility creates an ASCII representation of the database on tape or a specified disk file. It is used by db_import.sh at the time of an upgrade to transfer existing data described in the following pages.

The procedures outlined below are for exporting the database to tape for default tape devices.

Use the db_export.sh and db_import.sh utilities if you are upgrading to ACSLS 6.1.

Exporting to a disk file

You can export the ACSLS database to a disk file, as shown in the following procedure.

➡ **To export the ACSLS database to a disk file:**

Caution: The files created during the export must be saved to tape or to some other file system or other workstation so that they are not destroyed by the upgrade.

1. Open a command tool and log in as acsss.

2. Shut down ACSLS:

   idle (from cmd_proc)

   kill.acsss (from a command prompt)

3. Shut down the database:

    For ACSLS version 5.3 or 5.3.2:

    db_command stop

    For ACSLS version 5.4:

    db_command.sh stop

    For ACSLS version 6.0 or 6.0.1:

    db_command stop

    db_command ism_stop

4. Start the db_export.sh utility.

    db_export.sh −f *db_file*

    As it executes, the utility displays output indicating
    successful table data is being exported.

    When the program finishes, you see a message indicating
    the export is complete.

5. You are prompted to choose the version of ACSLS that
    you are exporting to. Valid choices are:

    1: 5.3.2 or 5.4
    2: 6.0 or 6.0.1
    3: 6.0.1 with L700e
    4: 6.0.1 with PUT0201
    5: 6.1 or later

    As it executes, the utility displays output indicating
    successful table data being exported.

6. The db_export.sh utility creates two files: db_file and db_file.misc.

    Ensure that these files are placed in or moved to a secure location where they won't be removed.

    Do **not** put these files in or under the following directories, because these directories may be cleared when ACSLS maintenance is installed:

    ○ $ACS_HOME
      (the ACSSS home directory)

    ○ $INFORMIX_BACKUP_DIRECTORY
      (directory where ACSLS backups are stored)

    ○ /tmp

    Note: If you plan to install a new release of the operating system, do **not** save the exported files on the ACSLS server.

7. Save your dynamic and static variables.

    If you are migrating from an earlier release and have modified the dynamic and static variables from their default values, you need to save them. To do this:

    Save the current settings of the variables to a file by entering:

    dv_config −d > *filename*

    Specify a filename that is preserved after the install. For example:

    dv_config −d > /export/backup/old_variables

Exporting to tape   You can export the ACSLS database to tape, as shown in the following procedure.

➡️   **To export the database to tape:**

1. Log in as `acsss`.

2. Shut down ACSLS:

    idle (from cmd_proc)

    kill.acsss (from a command prompt)

3. Shut down the database:

    For ACSLS version 5.3 or 5.3.2:

    db_command stop

    For ACSLS version 5.4:

    db_command.sh stop

    For ACSLS version 6.0 or 6.0.1:

    db_command stop

    db_command ism_stop

4. Insert a blank tape into the default tape device.

5. You are prompted to choose the version of ACSLS that you are exporting to. Valid choices are:

    1: 5.3.2 or 5.4
    2: 6.0 or 6.0.1
    3: 6.0.1 with L700e
    4: 6.0.1 with PUT0201
    5: 6.1 or later

    As it executes, the utility displays output indicating successful table data being exported.

6. Remove the cartridge from the drive only when the program completes and the prompt re-appears.

Caution: You will lose files if you remove the cartridge before the program completes the export. Write protect the cartridge and clearly mark it to identify the contents as the exported database.

Caution: Do not leave the cartridge in the library.

7. Save your dynamic and static variables.

If you are migrating from an earlier release and have modified the dynamic and static variables from their default values, you need to save them. To do this:

> Save the current settings of the variables to a file by entering:

> **dv_config −d >** *filename*

> Specify a filename that is preserved after the install. For example:

> **dv_config −d > /export/backup/old_variables**

Importing the Database

This section describes how to import and recreate the ACSLS database that you exported using the db_export.sh utility.

Importing from a disk file

You can import the ACSLS database from a disk file, as shown in the following procedure.

➡️ **To import the ACSLS database from a disk file:**

1. Log in as acsss.

2. Shut down ACSLS:

    idle (from cmd_proc)

    kill.acsss (from a command prompt)

3. Shut down the database:

    db_command stop

    db_command ism_stop

4. Start the db_import.sh utility.

    db_import.sh −f *db_file*

5. When you see the prompt about tables being destroyed from the ACSLS database, respond **y** to continue.

6. Verify the install as described in "Verifying the Imported Database and Library Configuration" in this chapter.

7. Press ⟦CTRL⟧+C when you see the following message. Do *not* insert a database backup tape. (An automated backup to local disk was already done.)

    ```
    Prepare for database backup ...
    Remove export tape.
    Insert database backup tape.
    [Hit RETURN to Continue or Ctrl-C to exit]
    ```

Importing from tape   You can import the ACSLS database from tape, as shown in the following procedure.

➡   **To import the database from tape:**

1. Log in as `acsss`.

2. Shut down ACSLS:

    `idle` (from cmd_proc)

    `kill.acsss` (from a command prompt)

3. Shut down the database:

    `db_command stop`

    `db_command ism_stop`

4. Insert the exported database tape that you exported with the db_export.sh command into the tape drive.

5. Run the database import utility by entering the following at a UNIX prompt.

    `db_import.sh`

    The db_import.sh utility displays several messages as it executes.

6. When you see the prompt about tables being destroyed from the ACSLS database, respond **y** to continue.

7. Verify the install as described in "Verifying the Imported Database and Library Configuration" in this chapter.

8. Press ⟦CTRL⟧+C when you see the following message. Do *not* insert a database backup tape. (An automated backup to local disk was already done.)

    ```
    Prepare for database backup ...
    Remove export tape.
    Insert database backup tape.
    [Hit RETURN to Continue or Ctrl-C to exit]
    ```

Verifying the Imported Database and Library Configuration

Use the following procedure to mount or dismount a volume to verify ACSLS.

⇨ **Mount/dismount a volume to verify ACSLS:**

1. Verify that you are logged in as `acsss`.

2. If ACSLS is not running, start it by entering

   `rc.acsss`

3. Query the server from the `cmd_proc` by entering

   `query server`

   If messages are displayed indicating that the server is in recovery mode, wait for a message indicating that the server is running.

4. Verify that the at least one of the following are online. If not, bring them online with the `vary` command.

   `query port all`

   `query acs all`

   `query lsm all`

   `query drive all`

5. Do you have at least one volume in an LSM?

YES	Continue with the procedure.
NO	Enter a volume into an LSM.

6. Mount a volume by entering:

   `mount` *`vol_id drive_id`*

   Hint: Use the **q**uery **dr**ive command to get the ID of an available drive and the **q**uery **vo**lume command to get the ID of a library volume. See Chapter 14, "Command Reference".

7. Did you see a message indicating a successful mount?

A successful mount message is:

`Mount:` *`vol_id`* `mounted on` *`drive_id`*

YES	Procedure is complete.
NO	If an error message appears, run this verification procedure again, ensuring that you specified a valid, available drive and a library volume. If the mount/dismount still fails, call StorageTek for assistance.

8. Dismount the volume by entering:

`dismount` *`vol_id drive_id`* **`force`**

where *`vol_id`* is the volume and *`drive_id`* is the drive you specified in Step 6.

Automatic Database Backup

ACSLS automatically creates a backup file of the database to disk every 24 hours at midnight or the time of day and days of the week you specified in the backup options in acsss_config. Refer to "Chapter 6: Verifying and Changing Dynamic and Static Variables."

The automatic database backup process creates a backup of the database on the level 0 archive. Updates to the database are recorded in the logical (transaction) logs. As these logical logs fill up, they are backed up and made available for re–use.

Table 23. Archive and Logical Logs

Backup type	Definition and Use
level 0 archive	• Provides a point-in-time snapshot copy of the entire database.
logical logs	• Transaction records of database changes made since the last checkpoint. • During database recovery using `rdb.acsss`, these files are applied sequentially to the checkpoint to re-create the database including all transactions since the checkpoint.

If you need to recover the database, the `rdb.acsss` utility can use the most current checkpoint on disk plus the logical logs to restore the database to its current state.

StorageTek supports an optional two–disk (primary and secondary) configuration for the ACSLS server. A two-disk configuration optimizes the database's ability to create backups and logical logs, and to recover from failures using these files.

In a two-disk server, the database (i.e., root database space) is mirrored. The root database space is on the primary disk, and a mirror copy is kept on the second disk. The backup is kept on

the second disk in a two–disk server. For detailed procedures about database and disk recoveries, see Appendix A. "Second Disk Support."

Performing Manual Backups to Tape

In addition to the automatic database backups that ACSLS creates, you should periodically run the bdb.acsss utility to manually create tape backups that can be stored offsite and used, if needed, for disaster recovery of the database. An offline backup lets you recover the database if both disks fail on a two-disk server.

Note: When you run the bdb.acsss utility, ACSLS automatically creates a backup on local disk as well. Note that running an automatic backup and bdb.acsss at the same time creates two local disk backups. Therefore, do not schedule automatic backups on days when you schedule bdb.acsss

Regular backups transferred to an offsite device can enable rapid restoration in the event of disaster to the ACSLS server.

StorageTek recommends that you use bdb.acsss to manually back up the database to tape after:

- Running acsss_config.

- Importing the database.

- An audit of the entire library.

- Any database recovery.

- Second disk installation/de–installation

Backing up to the Default Tape Device Attached to the ACSLS Server

➡ **To back up the ACSLS database to the default tape device attached to the ACSLS server, do the following:**

Refer to the *bdb.acsss* command in Chapter 13, "Utility Reference."

1. Log in as acsss.

2. Insert a blank tape into the tape device.

3. From a terminal window, enter the following command:

   bdb.acsss

4. Messages reporting the progress of the backup appear.

   Wait for the following message to appear:

   ```
   Check tape device (/dev/rmt/0) to make sure you
   have a tape in the tape drive.
   [Hit RETURN to continue or Ctrl-C to exit]
   ```

   Press **Return**.

5. Wait for the following message:

   ```
   ACSLS database backup successfully completed.
   ```

Backing up to a Specified Tape Device Attached to the ACSLS Server

➡ **To back up the ACSLS database to a specified tape device attached to the ACSLS server, do the following:**

Refer to the *bdb.acsss* command in Chapter 13", Utility Reference."

1. Log in as acsss.

2. Insert a blank tape into the tape device.

3. From a terminal window, enter the following command:

   bdb.acsss −f *tape_device*

   Where *tape_device* specifies a tape device attached to the ACSLS server.

4. Messages reporting the progress of the backup appear.

   Wait for the following message to appear:

   ```
   Check tape device (/dev/rmt/2) to make sure you
   have a tape in the tape drive.
   [Hit RETURN to continue or Ctrl-C to exit]
   ```

   Press **Return**.

5. Wait for the following message to appear:

   ```
   ACSLS database backup successfully completed.
   ```

Example—To back up the ACSLS database to tape device /dev/rmt/2, enter the following command:

   bdb.acsss −f /dev/rmt/2

Backing up to a UNIX File

> **Hint:** In the interest of disaster recovery, StorageTek does not recommend that you back up to a UNIX file unless the file is on a remote disk.

> Refer to the *dbd.accsss* command in Chapter 13", Utility Reference."

➡ **To back up the ACSLS database to a UNIX file, do the following:**

1. Log in as acsss.

2. From a terminal window enter the following command:

    bdb.acsss −f *db_file*

    Where *db_file* specifies a UNIX file to contain the ACSLS database. You must have write permissions to the file.

3. Wait for the following message to appear:

    ACSLS database backup successfully completed.

Backing up ACSLS and Restoring to Another Server

You can back up an ACSLS database on one server and restore it on a different but identical server. Both servers must:

- be on the same ACSLS release and maintenance level

- be on the same hardware and OS level

- have identical connections to the library hardware

Note: To restore a backup to another server, you must have backed up the database with the −s (server–to–server) option.

Backup Process

1. Log in as user `acsss`

2. Run `bdb.acsss −s`. The "s" option means server–to–server backup.

   `bdb.acsss −s`

   The backup process creates two files: `server_to_server.bak` and `server_to_server.bak.misc.tar.Z`. The files are found in the directory that was created during the installation process. By default, that directory is `$INFORMIX_BACKUP_DIRECTORY/server_to_server`

3. Transfer (ftp) the newly created files, `server_to_server.bak` and `server_to_server.bak.misc.tar.Z` to a location external to the server being backed up.

Restore the Backup to a Different Server

1. Log in as `acsss` to the machine where you will do the restore.

2. Transfer (ftp) the files from the archive location to the directory where you are restoring the files.

   You need both `server_to_server.bak` and `server_to_server.bak.misc.tar.Z`. They need to be

placed in the server_to_server directory
(`$INFORMIX_BACKUP_DIRECTORY/server_to_server`).

The files need to be owned by the user *informix* and have group ownerships of informix. If they are not, you need to:

- login as `root`

- + chown informix /export/backup/server_backup_file*

- + chgrp informix /export/backup/server_backup_file*

3. Bring down ACSLS.

   `kill.acsss`

4. Bring down the Informix Database Server and the Informix Storage Manager (ISM).

   ```
   db_command stop
   db_command ism_stop
   ```

5. Initiate a database restore

   `rdb.acsss`

6. Select option number 4 "Restore a backup created on a different server"

7. A prompt similar to the following is displayed:

   ```
   Please mount tape 1 on
   /export/backup/server_backup_file and press
   Enter to continue ...
   This is the file transferred from the server
   that the back up was created on.
   ```

8. Press <Enter>

9. An Informix prompt similar to the following is displayed:

   ```
   Continue restore? (y/n)
   ```

10. Type **y** for yes.

11. A prompt similar to the following is displayed:

    ```
    Do you want to back up the logs? (y/n)
    ```

    You do not need to backup the logical logs.

12. Type **n** for no.

13. A prompt similar to the following is displayed:

    ```
    Restore a level 1 archive (y/n)
    ```

    Since you are restoring a level 0 backup, there is no need to restore a level 1 backup.

14. Type **n** for no.

15. A prompt similar to the following is displayed:

    ```
    Do you want to restore log tapes? (y/n)
    ```

    We are not restoring the logical logs.

16. Type **n** for no.

    The restore is complete.

17. Select option 6 to exit.

    A prompt similar to the following is displayed:

    ```
    After performing a successful Informix database
    recovery you should do a disaster recovery
    backup. This will ensure your ability to
    recover again should you have another database
    failure. Do you want to do this database backup
    now? (y or n):
    ```

    ○ If you respond **y**, an automatic backup is made first to local disk. You see several messages indicating the backup has started, followed by messages showing the backup successfully completed. The backup is made to tape. If you do not have a tape in the tape drive, you are prompted to put one in.

    ○ If you respond **n**, an automatic backup is make to local disk. You see a series of messages indicating

the backup has started, followed by messages showing the backup completed successfully.

Recovering and Restoring

This section describes the following restoration/recovery procedures:

- Restoring a corrupted or lost database to the most recent backup

- Restoring a corrupted or lost database to a specified date and time

- Recovering from a primary disk failure

- Recovering from a secondary disk failure

- Disaster recovery for a failed server

- Recovering from a specific archived file

- Restoring non-database, miscellaneous files

Most of these procedures use the `rdb.acsss` utility, which provides options for restoring a database from the most recent backup or from a specified date and time; disaster recovery using a backup created by `bdb.acsss`; and restoring miscellaneous files created by `bdb.acsss`. For more information about these options, see "`rdb.acsss`" on page 349.

The `rdb.acsss` utility loads the database backup, then sequentially applies any available transaction log files to restore the database. If the transaction log files are available, the database can be restored to its state just before the failure, with essentially no loss of data.

Note: If the home cell of a cartridge changes from its last location after a backup, then the restored database will not be up–to–date. To avoid cartridge movement on dismounts:

- each LSM must be the only LSM in its ACS (true in most SCSI libraries), or

- the Extended Store Feature must be enabled for all LSMs that are connected to other LSMs via a pass–thru–port.

(For more information, see "Using the Extended Store Feature" on page 205). If the Extended Store Feature is not enabled for all connected LSMs or cartridges have been entered or ejected, you must audit the library after the restoration to make the database current.

Note: Do not specify the −f option as a general option for the rdb.acsss utility. If you backed up your database to an external network file or to an alternate tape device, you use the −f option only after entering rdb.acsss and then choosing the third recovery option. When prompted, enter −f and the pathname to your external network file or alternate tape device. See page 313 for more information.

Restoring the Database to the Most Recent Backup

In this procedure you restore the database to the most recent backup created on the local disk by automatic backups. Transaction log files are applied to make the database as current as possible. Miscellaneous ACSLS files from the backup are restored.

⇨ **To restore a corrupted or lost database to the most recent backup:**

1. Log in as acsss.

2. From the cmd_proc window, idle ACSLS:

   idle

3. Shut down ACSLS:

   kill.acsss

4. Shut down the database:

   For ACSLS version 6.0 or 6.0.1:

   db_command stop

   db_command ism_stop

5. Enter the following command:

   rdb.acsss

   The Database Recovery menu displays six options. For more information about these options, see "rdb.acsss" on page 349.

6. Select the first option:

   1. Restore from current local disk backup

7. Respond **n** to the following prompt:

   Are you restoring the primary disk from the second disk? (This will overlay the current

version of the ACSLS and Informix configuration
files.) (y or n):

You should see messages indicating the recovery is in
progress and the recovery completed successfully.

The Database Recovery menu displays.

8. Select option 6 to exit the recovery utility.

You see the following prompt:

After performing a successful Informix database
recovery you should do a disaster recovery
backup. This will ensure your ability to
recover again should you have another database
failure. Do you want to do this database backup
now? (y or n):

9. Respond **y** or **n**.

If you respond **y**, an automatic backup is made first to local
disk. You see several messages indicating the backup has
started , followed by messages showing the backup
successfully completed. Then the backup is made to tape.
If you do not have a tape in the tape drive, you are
prompted to put one in.

If you respond **n**, an automatic backup is made to local
disk. You see a series of messages indicating the backup
has started , followed by messages showing the backup
successfully completed.

10. To start ACSLS, enter the following command:

rc.acsss

Restoring the Database to a Specified Date and Time

In this procedure you restore the database to a backup prior to a specified date and time within the backup retention period. Archived transaction log files are applied to the backup up to the specified time. Miscellaneous ACSLS files are restored only from the backup.

➡ **To restore a database to a specified date and time:**

1. Log in as acsss.

2. From the cmd_proc window, idle ACSLS:

   idle

3. Shut down ACSLS:

   kill.acsss

4. Shut down the database:

   For ACSLS version 6.0 or 6.0.1:

   db_command stop

   db_command ism_stop

5. Enter the following command:

   rdb.acsss

   The Database Recovery menu displays five restoration options. For more information about these options, see "rdb.acsss" on page 349.

6. Select the second option:

   2. Restore from a previous local disk backup (to a point in time)

7. The following prompt displays:

   Informix database recovery started.
   You have taken backups on the following days.
   Please enter any date and time after the
   earliest backup displayed. The database will be
   recovered to the date and time you specified.

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```
YYYY-MM-DD      HH:MM:SS
YYYY-MM-DD      HH:MM:SS
YYYY-MM-DD      HH:MM:SS
```

```
Please enter the recovery date and time
(YYYY-MM-DD   HH:MM:SS):
```

8. Enter the date and time to which you want to recover the
   database.

   You should see messages indicating the recovery is in
   progress and the recovery completed successfully.

   Caution: If you previously did a point-in-time restoration,
   you can do a later point-in-time restoration *only* when the
   time selected is **before** the time specified for the earlier
   restoration.

9. Respond **y** to the following prompt:

   ```
   Do you want to restore the ACSLS and Informix
   configuration files to their previous state? (y
   or n):
   ```

   You should see messages indicating the recovery of
   miscellaneous and configuration files.

10. When the Database Recovery menu appears, select option
    6 to exit the recovery utility.

    You see the following prompt:

    ```
    After performing a successful Informix database
    recovery you should do a disaster recovery
    backup. This will ensure your ability to
    recover again should you have another database
    failure. Do you want to do this database backup
    now? (y or n):
    ```

11. Respond **y** or **n**.

    If you respond **y**, an automatic backup is made first to local
    disk. You see several messages indicating the backup has
    started , followed by messages showing the backup
    successfully completed. Then the backup is made to tape.

If you do not have a tape in the tape drive, you are prompted to put one in.

If you respond **n**, an automatic backup is made to local disk. You see a series of messages indicating the backup has started , followed by messages showing the backup successfully completed.

12. To start ACSLS, enter the following command:

`rc.acsss`

Recovering from a Primary Disk Failure

In this procedure, you recover a corrupted or lost primary disk from the secondary disk. To use this procedure, the secondary disk must be fully operational.

⇨ **To recover from a primary disk failure:**

1. If necessary, install the new primary disk. Follow the manufacturer's instructions.

2. Install the operating system.

3. Install ACSLS.

STOP

> **Warning:** You *must* install ACSLS in the same directory you used before the disk failure.

4. Log in as `acsss`.

5. From the cmd_proc window idle ACSLS:

   `idle`

6. Shut down ACSLS:

   `kill.acsss`

7. Shut down the database:

   For ACSLS version 6.0 or 6.0.1:

   `db_command stop`

   `db_command ism_stop`

8. Enter the following command:

   `rdb.acsss`

   The Database Recovery menu displays 6 restoration options. For more information about these options, see "rdb.acsss" on page 349.

9. Select the first option:

   `1. Restore from current local disk backup`

10. Respond **y** to the following prompt:

    ```
    Are you restoring the primary disk from the
    second disk? (This will overlay the current
    version of the ACSLS and Informix configuration
    files.) (y or n):
    ```

11. Press [[ENTER]] at the following prompt if you were using
    /second_disk directory for second disk support:

    ```
    What directory were you using for second disk
    support [/second_disk]?
    ```

12. Press [[ENTER]] at the following prompt if you were using
    /second_disk/backup directory for second disk backups:

    ```
    What second disk directory were you using for
    Informix backups [/second_disk/backup]?
    ```

13. You see several messages indicating the recovery is in
    progress and the recovery completed successfully. When
    the Database Recovery menu appears, select option 6 to
    exit the recovery utility.

    You see the following prompt:

    ```
    After performing a successful Informix database
    recovery you should do a disaster recovery
    backup. This will ensure your ability to
    recover again should you have another database
    failure. Do you want to do this database backup
    now? (y or n):
    ```

14. Respond **y** or **n**.

    If you respond **y**, an automatic backup is made first to local
    disk. You see several messages indicating the backup has
    started , followed by messages showing the backup
    successfully completed. Then the backup is made to tape.
    If you do not have a tape in the tape drive, you are
    prompted to put one in.

    If you respond **n**, an automatic backup is made to local
    disk. You see a series of messages indicating the backup

has started , followed by messages showing the backup successfully completed.

15. To start ACSLS, enter the following command:

    `rc.acsss`

16. You must run acsss_config to re-specify automated backup date and time and retention periods (Selection 5) *unless* you want to accept the default settings.

Recovering from a Second Disk Failure

Use this procedure if you have lost or corrupted the second disk.

To recover from a second disk failure:

1. De-install second disk support.

   Follow the procedures in "Appendix A: Second Disk Support".

   You can now run on just the primary disk.

   Hint: While you are using just the primary disk, you should take frequent backups to tape or to external disk using the bdb.acsss utility. See "bdb.acsss" in Chapter 13", Utility Reference."

2. If necessary, remove the second disk and re-install a new second disk following the manufacturer's instructions.

3. Install second disk support.

Recovering from a Failed Server

Use this procedure for a disaster recovery when you have lost or corrupted both primary and secondary disks.

To recover from a failed server:

1. If necessary, de-install both the primary and secondary disks and re-install new primary and secondary disks, following the manufacturer's instructions.

2. Install the operating system.

3. Install ACSLS.

   STOP

   Warning: You *must* install ACSLS in the same directory you used before the disk failure.

4. Log in as `acsss`.

5. From the cmd_proc window idle ACSLS:

   `idle`

6. Shut down ACSLS:

   `kill.acsss`

7. Shut down the database:

   For ACSLS version 6.0 or 6.0.1:

   `db_command stop`

   `db_command ism_stop`

8. Enter the following command:

   `rdb.acsss`

   The Database Recovery menu displays 6 restoration options. For more information about these options, see "rdb.acsss" on page 349.

9. Select the third option:

    ```
    3. Restore from a previous tape or network file
    backup
    ```

    This option restores the database from a backup created by bdb.acsss.

    The following prompt displays:

    ```
    To recover the ACSLS environment either:

    - Mount an ACSLS backup tape in the default
      tape device and press Enter,
    - Mount an ACSLS backup tape in another tape
      device and specify this tape device with
      '-f tape_device', or
    - Specify an external (network)file name
      containing an ACSLS backup with '-f
      backup_file'.
    Please mount tape (if used) and enter backup
    source:
    ```

10. Accept the default tape device by pressing [[ENTER]], or enter an external network filename or an alternate tape device by entering:

    -f *pathname*

    After you respond to this prompt, you see several messages indicating the recovery is in progress and the recovery completed successfully.

11. When the Database Recovery menu appears, select option 6 to exit the recovery utility.

    You see the following prompt:

    ```
    After performing a successful Informix database
    recovery you should do a disaster recovery
    backup. This will ensure your ability to
    recover again should you have another database
    failure. Do you want to do this database backup
    now? (y or n):
    ```

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12. Respond **y** or **n**.

If you respond **y**, an automatic backup is made first to local disk. You see several messages indicating the backup has started , followed by messages showing the backup successfully completed. Then the backup is made to tape. If you do not have a tape in the tape drive, you are prompted to put one in.

If you respond **n**, an automatic backup is made to local disk. You see a series of messages indicating the backup has started , followed by messages showing the backup successfully completed.

13. To start ACSLS, enter the following command:

`rc.acsss`

14. You must run acsss_config to re-specify automated backup date and time and retention periods
(Selection 5) *unless* you want to accept the default settings.

Recovering from a Specific Archived File

There may be contexts in which you would like to recover from
a specific tape or disk file archive that you have previously taken
using bdb.accsss -f. You can use a specific backup file for
recovery under two conditions:

- The archived backup that is used in recovery is the most
  recent backup taken on the system. In this case, do the
  following:

  1. Run the rdb.accsss utility.
  2. Select Option 3, using -f to specify the backup file
     or tape device.

- The archived backup is used immediately after re-installing
  the Informix /export/home and /export/backup
  directories. In this case, do the following:

  1. As root user, remove the following directories:

     ```
     /export/home/informix
     /export/backup/informix
         or
     /second_disk/backup informix
     /export/backup/misc
         or
     /second_disk/backup/misc
     ```

  2. Reinstall Informix from the ACSLS CD-ROM.

     a. Insert the CD-ROM into the CD-ROM drive.
     b. Execute the install.sh script.
     The installation script will replace only the
     directories that were removed in Step 1.

  3. Restore the database

     a. Run the rdb.accsss utility.
     b. Select Option 3, using -f to specify the backup
     file or tape device.

Restoring Miscellaneous ACSLS Files

In this procedure you restore miscellaneous ACSLS files. These are non-database files that include all files in the data/external directory such as access control files, the fixed volume file, the scratch preferences file, and custom volrpt files. These files are restored from a bdb.acsss backup to tape or an external network file.

➡ **To restore miscellaneous ACSLS files:**

1. Log in as acsss.

2. From the cmd_proc window, idle ACSLS:

   idle

3. Shut down ACSLS:

   kill.acsss

4. Shut down the database:

   For ACSLS version 6.0 or 6.0.1:

   db_command stop

   db_command ism_stop

5. Enter the following command:

   rdb.acsss

   The Database Recovery menu displays 6 restoration options. For more information about these options, see "rdb.acsss" on page 349.

6. Select option 5:

   4. Restore ACSLS non-database files

7. When the following prompt appears, accept the default tape device or enter an external network filename or an alternate tape device:

```
To recover the ACSLS environment either:

- Mount an ACSLS backup tape in the default
  tape device and press Enter,
- Mount an ACSLS backup tape in another tape
  device and specify this tape device with
  '-f tape_device', or
- Specify an external (network)file name
  containing an ACSLS backup with '-f
  backup_file'.
Please mount tape (if used) and enter backup
source:
```

After you respond to the prompt, you see several messages indicating the recovery is in progress and the recovery completed successfully.

8. When the Database Recovery menu appears, select option 6 to exit the recovery utility.

You see the following prompt:

```
After performing a successful Informix database
recovery you should do a disaster recovery
backup. This will ensure your ability to
recover again should you have another database
failure. Do you want to do this database backup
now? (y or n):
```

9. Respond **y** or **n**.

If you respond **y**, an automatic backup is made first to local disk. You see several messages indicating the backup has started , followed by messages showing the backup successfully completed. Then the backup is made to tape. If you do not have a tape in the tape drive, you are prompted to put one in.

If you respond **n**, an automatic backup is made to local disk. You see a series of messages indicating the backup

has started , followed by messages showing the backup successfully completed.

10. To start ACSLS, enter the following command:

`rc.acsss`

Restarting the Database

Use this procedure to start up the database manually. Normally, the database is started automatically when the library server is booted. Typically, you would use this procedure if the database is shut down but ACSLS is still running (for example, during a recovery).

To restart the database, do the following:

1. Log in as `acsss` and open a UNIX command tool.

2. Enter the following command:

   db_command start

Chapter 12. Reporting and Logging

This chapter discusses how to:

- Create a custom volume report

- Create a report for volume movement statistics

Creating a Custom Volume Report

You can use the the `volrpt` utility to create a volume report; for more information, see the `volrpt` utility in Chapter 13", Utility Reference."
`$ACS_HOME/data/external/volrpt/owner_id.volrpt` is a sample input file that you can run or use as a template to create customized volume reports. You can also save your customized volume reports in the `$ACS_HOME/data/external/volrpt` directory. Use this procedure to create an input file to the `volrpt` utility to create a custom volume report.

To create a custom volume report, do the following:

1. Log in as `acsss`.

2. Open a UNIX command tool.

3. Change to the custom volume report directory:

    cd /home/ACSSS/data/external/volrpt

4. Copy the sample volume report file to a new, custom file.

   cp owner_id.volrpt *my.volrpt*

   my.volrpt is the name you want to assign to the new file.

5. Using a text editor, such as vi, edit the *my.volrpt* file to specify the fields and formats you want to see on the custom report.

   ○ You can specify any of the fields listed in the sample file.

   ○ The format for each entry is:
     field_name field_length delimiter_length

   ○ You can make the field lengths and delimiters any size you wish. Just be sure all the fields you specify will fit on one line when the report prints.

   ○ Detailed editing instructions are given in the sample file.

6. When you are finished editing the file, save it.

Custom Volume Report Example 1

You create a customized report by designating fields, field length, and delimiter lengths in an input file, such as the one shown in the following Figure:

```
##################################################################
#
# File name: owner_id.volrpt
#
# This file describes the report layout for volrpt invoked with the -f option.
#       volrpt -f <filename>
#
# The format of a line is:
#       field_name      field_length          delimiter_length
#
# The field length is the number of characters which will be printed for
# the field. The delimiter length is the number of spaces that will be
# printed after the field.  If you leave out the lengths, or specify a
# value of -1, the default values will be used. Default delimiters are
# always 2. Here are the fields and their default lengths.
#
# ACCESS_COUNT        5                       2
# ACCESS_DATE         15                      2
# CELL_ID             13                      2
# DRIVE_ID            10                      2
# ENTRY_DATE          15                      2
# LABEL_ATTR          5                       2
# LOCK_ID             5                       2
# LOCK_TIME           15                      2
# MAX_USE             5                       2
# MEDIA_TYPE          7                       2
# OWNER_ID            20                      2
# POOL_ID             5                       2
# VOLUME_ID           6                       2
# VOL_STATUS          17                      2
# VOLUME_TYPE         4                       2
#
# Revision History:
# xx/xx/xx   Name      Changes
#
##################################################################
VOLUME_ID             6                       2
DRIVE_ID              12                      2
CELL_ID               15                      2
OWNER_ID              -1                      0
```

Figure 40. Sample Volrpt Input File

From this input file you generate the customized report shown. Among other uses, a customized report allows you to report the owners of volumes.

```
1998-06-30 13:22:07

TOTAL   VOLUMES:   2           SEQUENCE:      sort by volume identifier

Volume Media                                  Home          Owner
Label  Type                     Drive ID      Location      ID

RB1400 3480                     Not-in-drv    0, 1, 1, 0, 0 cray
RB1401 DD3A                     0, 0, 1, 0    0 1, 2, 0, 0  cray
```

Figure 41. Customized Volume Report Using Input File

Custom Volume Report Example 2

The following volrpt includes ACSs 0 and 1, absent and ejected cartridges, and shows the status of volumes.

The input volrpt options are:

volrpt -f my.volrpt -a 0 1 -i

These control statements are used to select and format the output:

```
CELL_ID              13               2
VOLUME_ID            6                2
VOL_STATUS           17               0
POOL_ID              5                0
ACCESS_COUNT         5                1
LOCK_ID              5                0
OWNER_ID             20               0
```

Figure 42. Sample volrpt Control Statements

```
                        VOLUME REPORT UTILITY
2002-06-03 15:27:48

TOTAL VOLUMES: 61      SEQUENCE: sort by volume identifier

Home            Volume   Volume          Pool  Times  Lock Owner
Location---     Label    Status          ID    Mount  ID   ID------------

1, 0, 0, 0, 0   ABC001   VOLUME_HOME      0     2      0       shern
0,-1, 0, 0, 0   ABC002   VOLUME_ABSENT    0     0      0
0,-1, 0, 0, 0   ABC003   VOLUME_ABSENT    0     0      0
1, 3, 0, 0, 3   ABC004   VOLUME_MISSING   0     0      0
1, 3, 0, 0, 4   ABC005   VOLUME_MISSING   4     0      28001 dan
1, 3, 0, 0, 5   ABC006   VOLUME_MISSING   0     0      0
0,-1, 0, 0, 0   ABC007   VOLUME_ABSENT    0     0      0
1, 0, 0, 0, 7   ABC008   VOLUME_HOME      0     0      0
0,-1, 0, 0, 0   ABC009   VOLUME_ABSENT    0     0      0
0,-1, 0, 0, 0   ABC010   VOLUME_ABSENT    0     0      0       shern
1, 0, 0, 0,10   ABC011   VOLUME_HOME      0     0      0
1, 0, 0, 0,12   ABC012   VOLUME_HOME      0     0      2371  abc012
1, 0, 0, 0,13   ABC013   VOLUME_HOME      0     0      28001
1, 0, 0, 0,14   ABC014   VOLUME_HOME      0     0      28001
0,-1, 0, 0, 0   ABC015   VOLUME_ABSENT    1     0      29712
0,-1, 0, 0, 0   ABC016   VOLUME_EJECTED   1     0      29712
0,-1, 0, 0, 0   ABC017   VOLUME_ABSENT    1     0      29712
0,-1, 0, 0, 0   ABC018   VOLUME_ABSENT    1     0      29712
1, 0, 0, 0,19   ABC019   VOLUME_HOME      1     0      0
1, 0, 0, 0,20   ABC020   VOLUME_HOME      1     0      0
0,-1, 0, 0, 0   ABC021   VOLUME_ABSENT    0     0      0
0,-1, 0, 0, 0   ABC022   VOLUME_ABSENT    4     0      0
```

Figure 43. Customized volrpt Showing Absent and Ejected Cartridges

Creating a Logging Volume Statistics Report

You can use the volume statistics log file (`acsss_stats.log`) to log volume movement statistics. These statistics consist of entries for each time ACSLS detects that a volume's location changed. ACSLS logs entries for enters, ejects, mounts, dismounts, and for each time an audit detects that a volume's location has changed (typically, by being manually moved).

You use the `acsss_config` configuration program to do the following:

- Enable or disable volume statistics logging

- Specify the maximum size of the volume statistics log file

- Specify the number of rollover files for the volume statistics log file

The volume statistics log file contains *collection mode entries* that tell if volume statistics logging is enabled or disabled and *volume statistics entries*.

```
1998-06-30 08:53:00 CONFIG
Library volume statistics on.


1998-06-30 09:23:08 EJECT
U01120 Home 0,0,1,3,5 Cap 1,0,0 Client Host Id 129.81.15.25


1998-06-30 10:36:05 ENTER
PB0444 Home 0,0,4,3,5 Cap 0,0,0 Client Host Id 129.81.15.25


1998-06-30 10:42:48 MOUNT
PB0478 Home 0,0,1,35,1 Drive 0,0,1,0 Client Host Id Local


1998-06-30 10:43:19 DISMOUNT
PB0478 Home 0,0,1,35,1 Drive 0,0,1,0 Client Host Id Local


1998-06-30 10:43:19 AUDIT
RB0478 0,0,1,35,1  STATUS_VOLUME_NOT_FOUND Client Host Id JBHUTTO


1998-06-30  10:43:19  AUDIT
PB0444  0,0,1,32,1 STATUS_VOLUME_FOUND Client Host Id JBHUTTO


1998-06-30 10:45:00 CONFIG
Library volume statistics off.

2001-01-16 09:51:07 ACSCR
OA1235 Home 0,0,5,14,14 STATUS_VOLUME_NOT_FOUND Client Host Id Local

2001-01-16 09:40:13 ACSCR
OA123A Home 0,0,5,14,15 STATUS_VOLUME_FOUND Client Host Id Local

2001-01-16 09:51:07 ACSCR
OA1235 Drive 0,0,1,0 STATUS_VOLUME_FOUND Client Host Id Local
```

Figure 44. Example of Volume Statistics Log File Entries

In the example shown in the previous Figure, the collection
mode entries show that statistics collection started at 8:53 a. m.
on May 30, 1998 and ended at 10:45 a.m. the same day. These
collection start and stop times bracket the volume statistics
entries for this collection period.

As Figure 44 shows, the format of the volume statistics entries
is:

```
yyyy-mm-dd hh:mm:ss command
vol_id home_loc function_loc client_host_ID
```

Where:

yyyy-mm-dd

     is the year, month, and day of the entry. Four–digit year
     formats are supported. You specify the date format via the
     `acsss_config` program.

hh:mm:ss

     is the hour, minute, and second of the entry.

command

     is the ACSLS command or client request that either moved
     the volume or (for audits) detected that the volume was
     moved.

     MOUNT

          <u>mou</u>nt request.

     DISMOUNT

          <u>dis</u>mount request.

     ENTER

          manual or automatic mode <u>ent</u>er request.

     EJECT

          <u>ej</u>ect request.

     AUDIT

          <u>au</u>dit request.

     ACSCR

          Cartridge Recovery activity. This activity is
          generated automatically by ACSLS processing.

vol_id
>   is the volume ID.

home_loc
>   is the volume's home (storage cell) location.

function_loc
>   is the volume's location for the requests that used the
>   volume as follows:

>   <u>mou</u>nt or <u>dis</u>mount requests
>>   location is a transport ID.

>   <u>en</u>ter or <u>ej</u>ect requests
>>   location is a CAP ID.

>   <u>au</u>dit requests
>>   specifies that an audit detected one of the following
>>   errors:

>>   STATUS_VOLUME_FOUND
>>>   The audit found a volume in a location that did
>>>   not match the location specified in the database.

>>   STATUS_VOLUME_NOT_FOUND
>>>   The audit did not find a volume in the location
>>>   specified in the database.

>   Cartridge Recovery activity
>>   Location may be a cell ID or a transport ID,
>>   indicating that Cartridge Recovery detected one of
>>   the following situations:

>>   STATUS_VOLUME_FOUND
>>>   A volume was found which was not recorded in
>>>   the database, and is being added.

>>   STATUS_VOLUME_NOT_FOUND
>>>   A volume in the database was not found in any
>>>   recorded location, and is being deleted.

client_host_ID
    is one of the following;

- For client application requests, the host IP address.

- For `cmd_proc` commands, if the environment variable `LIBVOLSTATS_CMD_PROC_ID` is set (ASCII characters only) in the environment of the shell that started the `cmd_proc`, the entry is the first 12 characters of the value of the environment variable.

- For `cmd_proc` commands, if the environment variable `LIBVOLSTATS_CMD_PROC_ID` is not set or contains non-ASCII characters, the entry is `Local`.

Chapter 13. Utility Reference

This chapter tells how to use the following ACSLS utilities:

`bdb.acsss`
> backs up the ACSLS database and miscellaneous library resource files.

`config drives`
> dynamically enables the addition of drives, changes in drive types, and the deletion of drives on existing drive panels while ACSLS is running.

`db_command`
> starts or stops the database.

`db_export.sh`
> exports the ACSLS database information and miscellaneous files in preparation for an upgrade installation or reinstallation of ACSLS.

`db_import.sh`
> imports the ACSLS database information and miscellaneous files exported when you used the `db_export.sh` utility.

`del_vol`
> deletes a volume from an offline LSM.

`kill.acsss`
> terminates ACSLS.

`rc.acsss`
> starts ACSLS.

`rdb.acsss`
> restores the ACSLS database and miscellaneous library
> resource files.

`sd_mgr.sh`
> installs or deinstalls second disk support.

`volrpt`
> creates a volume report.

Using the ACSLS Utilities

Follow these general guidelines for using the ACSLS utilities:

- You must log in as `acsss` to ensure the proper environment to run ACSLS utilities.

  You should not `su` to `acsss`.

- StorageTek recommends that you use `bdb.acsss` to manually back up the database to tape after:

  - Configuring your library hardware.

  - Importing the database. After you upgrade to a new version of ACSLS, *do not* use database backups or exports created with previous versions. Make sure, however, to create a new backup as soon as you have upgraded.

  - Any database recovery.

- To ensure that you recover an accurate and consistent database, always use the most current database backup.

If a utility fails, retain all event logs. These logs will help StorageTek to resolve any problems. For more information, see Appendix B, *Troubleshooting*, "Logs of ACSLS Installation and Utilities" on page 583.

bdb.acsss

The bdb.acsss utility backs up the ACSLS database and miscellaneous library resource files.

Note: When you run the bdb.acsss utility, ACSLS automatically creates a backup on local disk as well. Note that running an automatic backup and bdb.acsss at the same time creates two local disk backups. Therefore, do not schedule automatic backups on days when you schedule bdb.acsss.

Format

bdb.acsss [-s] [-f *db_file* | *tape_device*]

Hint: If you enter bdb.acsss with no options, the backup utility defaults to the default tape device attached and configured to the ACSLS server.

Options

Note: [-s] and [-f] are mutually exclusive options.

[-s]
  creates a server–to–server backup. Locates the backup on a file system external to the ACSLS server.

  Note: Make sure this location has space for a large backup. This file could be as large as 200 megabytes.

-f *db_file*
  specifies a UNIX file to contain the ACSLS database backup. You must have write permissions to the file.

-f *tape_device*
  specifies any tape device attached and configured to the ACSLS server.

Usage   Use the `bdb.acsss` utility to manually back up the ACSLS database to tape or to an external network file to create backups that can be used, if needed, for disaster recovery of the database. A tape backup, for example, lets you recover the database if both disks fail on a two–disk server. See "Doing Manual Backups to Tape" on page NO TAG for detailed procedures for different types of backups.

How often you back up the database depends on the amount of library activity. In general, you should back up the database often for frequent changes to library contents or configuration.

StorageTek recommends that you use `bdb.acsss` to manually back up the database to tape after:

- Running `acsss_config`.

- Importing the database. After you upgrade to a new version of ACSLS, *do not* use database backups or exports created with previous versions. Make sure, however, to create a new backup as soon as you have upgraded.

- An audit of the entire library.

- Any database recovery.

Notes: Recovery from a manual backup will succeed under either of the following two conditions:

- The archived backup that is used in recovery is the most recent backup taken on the system.

- The archived backup is used immediately after re-installing the Informix directories in `/export/home` and `/export/backup`.

  See Chapter 11, *Database Backup and Restore*, "Recovering from a Failed Server" and "Recovering from a Specific Archived File."

See Also

- Doing Manual Backups to Tape, page NO TAG.

- `rdb.acsss` Utility, page 349.

- Chapter 11, *Database Backup and Restore*, backup sections and "Recovering and Restoring."

config drives

The `config drives` utility enables the dynamic addition of drives, changes in drive types or serial numbers, and the deletion of drives on existing drive panels while ACSLS is running.

Format

`config drives` *panel_id*

Options

panel_id
> The panel containing the drives you are adding, changing, or deleting.

Usage

- After you enter your drive changes using the `config drives` utility, if drives are added or deleted, you are prompted to confirm the changes. You must confirm the changes within 10 minutes or the utility will time out and exit.

- Use the `config drives` utility for dynamic changes to drive configurations, which include installation, replacement, or removal of drives on an existing drive panel. Other changes to tape library hardware configurations such as changes in the number and/or location of storage cells, number or size of CAPs, or replacement of a storage cell panel with a drive panel must be made using the `acsss_config` utility.

- The `config drive` utility does *not* have a provision for adding new drive types or media types that are not already supported in the current version of ACSLS. New drive and media types are added via enhancements to ACSLS.

Notes

- ACSLS must be running, and the LSM containing the panel with the changed drive configuration must be online or in diagnostic mode.

- On the drive panel being reconfigured all drives must be ready.

- On a SCSI library, all drives must have been ready when the library was last IPLed and the drives must still be ready.

- When new drives replace existing drives, varying the LSMs or drive types online or running `config drives` automatically updates the drive types and drive serial numbers.

Examples   To add or remove a drive on an existing drive panel:

config drives 0,1,10

The old and new drive configuration on the panel is displayed.

If any drives were added or deleted, you will be prompted as follows:

```
Enter 'y' to confirm changes to the drive
configuration for this panel.
```

```
$ config drives 0,0,10
Drive Configuration Change for panelid: 0,0,10
Drive id   Old Type          New Type        chg Drive Serial Number
--------   --------          --------            ----------------------
0          9840              T9940B           * 479000000130
1          9840              T9940B           * 479000000131
2          9840              T9940B           * 479000000132
3          9840              IBM-LTO          * 1311025710
4          9840              IBM-LTO          * 1311025711
5          T9940A            IBM-LTO          * 1311025712
6          T9940A            T9940B           * 479000000133
7          T9940A            T9940B           * 479000000134
8          not installed     T9940B           * 479000000135
9          not installed     T9940B           * 479000000136


Enter 'y' to confirm changes to the drive configuration for this panel:
y  Drive configuration updated.
```

Figure 45. Adding or Removing Drives with `config drives`

To update drive types or drive serial numbers on a drive panel:

config drives 0,2,9

For existing drives, the drive types and serial numbers will be updated automatically and the config drives utility will display the following message:

No drives were added or deleted. Drive configuration unchanged.

The utility then exits.

```
$ config drives 0,0,10
Drive Configuration Change for panelid: 0,0,10
Drive id   Old Type          New Type         chg Drive Serial Number
--------   --------          --------         ----------------------
 0         9840              T9940B             * 479000000145
 1         T9940A            unchanged            456000000250
 2         T9940A            unchanged            456000000251
 3         T9940A            T9840B             * 456000000252
 4         T9940A            unchanged            456000000253
 5         T9940A            unchanged            456000000254
 6         not installed     unchanged
 7         not installed     unchanged
 8         not installed     unchanged
 9         not installed     unchanged

No drives were added or deleted. Drive configuration unchanged.
```

Figure 46. Updating Drive Information with `config drives`

See Also   Using the acsss_config utility for other changes to tape library hardware configurations. See Chapter 7, *Configuring your Library Hardware*.

db_command

The db_command command starts or shuts down the database.

Warning: You must terminate ACSLS using the idle command and the kill.acsss utility *before* you stop the database.

Format

db_command [start|stop|ism-stop]

Options

start
>   starts the database.

stop
>   shuts down the database.

ism_stop
>   shuts down Informix Storage Manager

Examples   To start the database, enter the following:

>   **db_command start**

To shut down the database, enter the following:

>   **db_command stop**

db_export.sh

The db_export.sh utility exports the ACSLS database table data and miscellaneous files in preparation for an upgrade installation or a reinstallation of ACSLS.

Format

db_export.sh [−f *db_file*]

Hint: If you enter db_export.sh with no options, the export utility defaults to the default tape device attached and configured to the ACSLS server.

Options

-f *db_file*
>   specifies a UNIX file to contain a backup of the ACSLS database. You must have write permissions to the file.

Note: If you export the database to a file, the file must reside in a non–volatile directory. If your intention is to re–install ACSLS, the re–installation will destroy the $ACS_HOME directory. Consequently, you should place the exported file elsewhere in your file system.

Usage

Use the db_export.sh utility to prepare for a reinstallation of ACSLS or an upgrade installation of ACSLS.

Examples

Refer to Chapter 11, *Database Backup and Restore* for examples.

See Also

- db_import.sh

- rdb.acsss Utility, page 349.

- Chapter 11, *Database Backup and Restore,* "Exporting the Database."

db_import.sh

The db_import.sh utility imports the ACSLS database table data and the miscellaneous files that you exported when you used the db_export.sh utility.

Format

db_import.sh [−f *db_file*]

Options

-f *db_file*
    specifies a UNIX file created by db_export.sh.

Usage   Use the db_import.sh utility to import the ACSLS database that you exported using the db_export.sh utility.

Caution: The db_import utility will not run if ACSLS is running.

Examples   Refer to Chapter 11, *Database Backup and Restore*, for examples.

See Also

- db_export.sh

- rdb.acsss Utility, page 349.

- Chapter 11, *Database Backup and Restore*, "Importing the Database."

del_vol

The del_vol utility deletes from the database volumes that either:

- cannot be found in the library, or

- are marked as absent or ejected, or

- are in an offline LSM or drive (missing).

Note: This utility does not delete a volume that is found in the library.

Note: You can use the del_vol utility to remove a volume record without waiting for the expiration of an absent or ejected status.

Format

del_vol [–n] [–d] [–q] *vol_id*

Options

–n

> Optional; no-confirm mode; delete volume without prompting user if all locations can not be examined.

–q

> Optional; quiet mode; do not print out all information extracted from the database.

–d

> Optional; delete the volume; do not mark it absent. Use this option to remove absent or ejected volumes from the database.

vol_id
> The volume serial number to be deleted.

The Manual Volume Delete (del_vol) utility can now retain volumes as absent. Using the **−d** option deletes the specified volume without waiting for the expiration of an absent or ejected status.

Note: If all of the referenced locations for the volume can't be verified (i.e., the LSM is offline or the drive is not ready), you are prompted to confirm the deletion unless the –n (no_confirm_flag) is on. After confirmation, or if the no_confirm_flag is on, the volume and information associated with it, such as scratch pool membership and current and pending locks, are removed from the database. Volume–related information is displayed unless the –q (quiet_flag) has been entered. If multiple options are used, they can be formatted either as separate options or as a contiguous string.

Usage   ACSLS and the database must be up and running (*not* idle) to use this utility. Typically, you use the del_vol utility to delete a volume from an offline LSM so that you can re–enter the volume into the CAP of an online LSM. Make sure that you manually remove the same cartridge as the volume you deleted from the database. If you delete a volume from the database, but mistakenly remove another cartridge from the LSM, return the cartridge to its proper cell in the LSM and then remove the correct cartridge.

You can use del_vol to remove a volume from an ofline LSM and then reenter it in an online LSM, so it can be automatically mounted. To do this:

- Remove the volume from the offline LSM.

- Use del_vol to mark the volume as absent.

- Enter the volume into the online LSM.

Using del_vol, removes from the database the volume and all information associated with it, such as scratch pool membership and current and pending locks (provided the absent volume

retention period is zero). All available information related to the volume is printed out and verified. You must manually remove the cartridge from the LSM.

STOP

Warnings:

- If you mistakenly delete a volume from the database, you should do an `audit` on the sub–panel containing the home cell of the deleted volume to re–enter the volume into the database.

- Running del_vol while the system is in recovery can produce unpredictable results. The recovery sequence happens during a `vary LSM online`.

Example   To delete volume U01102 without a printout of the volume information:

```
del_vol -q U01102
```

See Also   Chapter 10, *Cartridge Management*, "Using the Manual Volume Delete Utility".

kill.acsss

The `kill.acsss` utility terminates ACSLS.

Format

```
kill.acsss
```

Options   None.

Usage   Use the `kill.acsss` utility to terminate ACSLS.

Examples

`kill.acsss`

See Also   `rc.acsss`

`idle` command

Caution: *Do not* run `kill.acsss` while an ACSLS request is in progress! You must first idle ACSLS (with the `idle` command) before you run `kill.acsss`.

Note: `kill.acsss` does *not* shut down the database. You must issue `db_command stop` and `db_command ism_stop` if you want to shut down the database after you shut down ACSLS.

---

rc.acsss

The rc.acsss utility brings ACSLS up and automatically starts the database. There is no need to manually start the database.

Format

```
rc.acsss [idle]
```

Options

idle brings ACSLS up in the idle state.

Usage Use the rc.acsss utility to start ACSLS. When you start ACSLS, it goes through recovery mode to online state. ACSLS initialization includes checking its database and "recovering" status of the library volumes and library hardware.

Examples

rc.acsss

See Also kill.acsss

start command

Note: If you are not logged in as acsss and try to run rc.acsss, the system prompts you for the acsss password.

You can run only one copy of ACSLS on the server. rc.acsss will not restart ACSLS if it is already running.

Note: rc.acsss automatically starts the database when it starts ACSLS.

rdb.acsss

The `rdb.acsss` utility restores the ACSLS database and miscellaneous library resource files using a backup created by either the automatic backup function or the `bdb.acsss` utility.

Format

```
rdb.acsss
```

Note: Do not specify the `-f` option when you run the `rdb.acsss` utility.

If you backed up your database to an external network file or to an alternate tape device, you use the `-f` option only after entering `rdb.acsss` and then choosing the third recovery option. When prompted, enter `-f` and the path name to your external network file or alternate tape device.

Menu Options

When you run `rdb.acsss`, a menu displays five options:

```
   Please enter the number followed by Return for your choice from
   the following menu.

   Press ? followed by the Return key for help.

           1: Restore from current local disk backup
           2: Restore from previous local disk backup (to a point in time)
           3: Restore from a previous tape or network file backup
           4: Restore a backup created on a different server
           5: Restore ACSLS non-database files
           E: Exit
```

Figure 47. `rdb.acsss` **Menu Options**

1. Restore from current local disk backup

   Explanation: The database is recovered from the most recent backup to disk, and the transaction logs are applied

to restore all committed updates. Miscellaneous ACSLS files are restored.

Usage: Use this option to restore a corrupted or lost database or to recover the database on the primary disk from a backup on the secondary disk.

2. `Restore from previous local disk backup (to a point in time)`

Explanation: The database is restored to the last backup before the specified date and time within the backup retention period. Archived transaction logs are applied up to the specified date and time. Miscellaneous ACSLS files are restored from the backup only.

Usage: Use this option to restore the database back to a specific date and time.

3. `Restore from a previous tape or network file backup`

Explanation: The database is restored from an external, manual backup created by `bdb.acsss`. The backup is on either tape or an external network file. Miscellaneous ACSLS files are restored. Logical logs are not applied.

Usage: Use this option to recover the ACSLS environment after a server failure when both disks are corrupted or lost.

4. `Restore ACSLS from a server-to-server backup`

Explanation: The database is restored from a server–to–server backup created by `bdb.acsss` using the `-s` option.

Usage: Use this option to recover ACSLS to a standby server. In this configuration, ACSLS runs on a primary server. If the primary server fails, the most recent backup is restored to a redundant standby server.

Note: The backup must have been created with the `bdb.acsss -s` option.

5. `Restore ACSLS non-database files`

Explanation: Only the non–database, miscellaneous ACSLS files are restored from a manual tape backup or an external network file backup.

Usage: Use this option to restore ACSLS data existing in data/external: access control files, custom volrpt files, fixed volume file, and scratch preferences file.

6. Exit

Exits the `rdb.acsss` utility. When you exit the `rdb.acsss` utility, you are prompted to do a backup. If you choose not to do a backup, ACSLS automatically performs a backup to a local disk.

See Also

- Recovery Procedures for:

  ○ Restoring a corrupted or lost database to the most recent backup

  ○ Restoring a corrupted or lost database to a specified date and time

  ○ Recovering from a primary disk failure

  ○ Recovering from a secondary disk failure

  ○ Disaster recovery for a failed server

  ○ Restoring non-database, miscellaneous files

  ○ Restoring from a server–to–server backup

- `bdb.acsss` utility on page NO TAG

sd_mgr.sh

The sd_mgr.sh utility installs or deinstalls second disk support.

Format

```
sd_mgr.sh
```

Options   None.

Usage   Use the sd_mgr.sh utility to install or deinstall a second disk.

You can deinstall a second disk to go back to a single–disk system. You may want to do this to take the second disk offline for service or replacement.

See Also   Appendix A, "Second Disk Support" for the uses of the sd_mgr.sh utility.

volrpt

The `volrpt` utility creates a volume report.

Format

```
volrpt [-s vol|loc|use] [-d] [-f filename] [-z]
[-a|-l|-v identifier_list] [-i]
```

Options

-s

specifies the sort order. If you do not specify this option, the default is to sort by volume ID. If you specify this option, you must specify one of the following values:

vol

sort by volume ID.

loc

sort by volume home location.

use

sort by volume use (number of mounts).

-d

specifies that the output contains no page breaks or header information. The output can be used as input to other programs such as `pr`.

-f filename

filename specifies a custom volrpt template.

-z

zero fills identifier fields.

-a

Restricts the report to the specified ACS. You can specify multiple ACSs (use blanks to separate the acs_ids).

Note: If you specify multiple ACS configurations the default is to report only the first ACS specified.

-l

> Restricts the report to the specified LSM. You can specify multiple LSMs (use blanks to separate the *lsm_id*s).

-v

> Restricts the report to the specified volumes (or volume ranges). You can specify a single *vol_id*, a list of *vol_id*s separated by blanks, or a volume range indicated by *vol_id–vol_id*.

−i

> reports all volumes, including absent and ejected cartridges.

> If this option is not specified, absent and ejected cartridges are not reported.

Usage   Use the volrpt utility to create a report of library volumes, including their physical location, history, attributes, and use. You can also use volrpt to verify the database after you restore it. You can use the −a, -l, or -v options to specify the ACSs, LSMs, or volumes for the report. If you do not specify any of these options, volrpt reports on only ACS 0.

Figure 45 shows an example of a standard volume report, which contains fields for volume id, location, label type, media type, and history of usage.

```
                        VOLUME REPORT UTILITY

     2002-06-30 14:01:21

     TOTAL VOLUMES: 400    SEQUENCE: sort by volume identifier

     Volume    Home        Label   Volume      Times   |---Entered--|      |--Last Used--|
     Label     Location    Type    Type/Media  Mounted  Date     Time       Date     Time

     CLN000    0,0,1,0,3   Ext     C/STK1U     1        08/22/01 09:30     10/04/01  14:26
     RB0000    0,1,2,1,10  Ext.    D/STK1R     3        10/01/01 08:16     10/01/01  08:18
     RB1400    0,0,10,1,3  Ext.    S/STK1R     243      10/01/01 09:30     10/06/01  11:04
     RB1401    0,0,10,3,5  Virt.   D/STK1R     12       10/01/01 03:29     10/05/01  23:11
        •         •          •        •          •         •                  •
        •         •          •        •          •         •                  •
        •         •          •        •          •         •                  •
     TB1440    0,1,3,1,9   Ext.    D/STK2P     43       08/12/01 09:11     09/28/01  17:52
        •         •          •        •          •         •                  •
        •         •          •        •          •         •                  •
        •         •          •        •          •         •                  •
```

Figure 48. Standard Volume Report

In the `Volume Type/Media` column shown in Figure 45, `C` denotes cleaning cartridges, `D` denotes data volumes, and `S` denotes scratch volumes.

You use the `-f` *filename* option to create a customized report; see *Creating a Custom Report* in Chapter 12, *Reporting and Logging*, for more information.

`$ACS_HOME/data/external/volrpt/owner_id.volrpt` is a sample input file that you can run or use as a template to create customized volume reports. You can also save your customized volume reports in the `$ACS_HOME/data/external/volrpt` directory.

You can redirect the volume report to a file with standard UNIX redirection:

> **volrpt** > *file*

Examples

By default, volrpt reports only the first ACS in the list. To report the volumes in both ACS 0 and ACS 1, enter:

volrpt −a 0 1

To report the volumes in LSMs 0,1 and 2,1 sorted by home cell location, enter:

volrpt −s loc −l 0,1 2,1

Notes volrpt displays the specified volume report if it completes successfully. volrpt prints a message to stderr and exits if you specify the −f option and volrpt cannot find the specified file or you specify more than one input file. For field errors within the input file, volrpt prints a message to stderr and ignores the line in error but does not exit.

If you use the -v option and the specified volumes are not in the database or library component you specify, volrpt returns only a no volumes found message.

See Also "Creating a Custom Volume Report" in Chapter 12, *Reporting and Logging.*

Chapter 14. Command Reference

This chapter describes the ACSLS commands, including general command syntax and reference information for the following commands.

<u>au</u>dit
> Creates or updates the database inventory of the volumes in a library component.

<u>can</u>cel
> Cancels a current or pending request.

<u>cle</u>ar <u>l</u>ock
> Removes all active and pending locks on transports or volumes.

<u>def</u>ine <u>poo</u>l
> Creates or modifies scratch pools.

<u>del</u>ete <u>poo</u>l
> Deletes empty scratch pools.

<u>dis</u>mount
> Dismounts a volume.

<u>ej</u>ect
> Ejects one or more volumes from the ACS.

<u>en</u>ter
> Sets a CAP to enter mode.

<u>idle</u>
> Stops ACSLS from processing new requests.

lock
>   Locks (dedicates) a volume or transport to a user.

move
>   moves a specified volume to an available storage cell in a specified LSM.

logoff
>   Exits from `cmd_proc`.

mount
>   Mounts a data or scratch volume.

query
>   Displays the status of a library component.

set
>   Sets various attributes of different library components.

show
>   Displays your lock ID or user ID.

start
>   Starts ACSLS request processing.

switch **lm**u
>   Manually switches ACS management from the ACS's master LMU to the standby LMU.

unlock
>   Removes active locks on volumes or transports.

vary
>   Changes the state of an ACS, LSM, CAP, transport, or port.

venter
>   Enters one or more volumes with missing or unreadable labels into the ACS.

General Command Syntax

This section describes the general syntax of the ACSLS commands. The following sections fully describe each command, including its syntax.

ACSLS commands use the following general syntax:

> *command type identifier state options*

Where:

> *type identifier*
> > is the ACS component and its identifier; see "Component Types and Identifiers" for more information.
>
> *state*
> > is a device state for the <u>va</u>ry command only.
>
> *options*
> > are command options; see the description of the command you want to run.

Also note the following syntax rules:

- You must enter commands in the order shown above (command name, followed by the component and its identifier, followed by the state and any options).

- This chapter shows commands in lowercase, but you can enter commands in any combination of lowercase and uppercase letters.

- Underlines show minimum abbreviations for commands and keywords. For example, query server and q ser are both valid forms of the <u>query</u> <u>ser</u>ver command.

- Ellipses (...) indicate that you can repeat an identifier.

- Brackets [ ] enclose optional options.

Component Types and Identifiers

Table 24. describes the valid ranges of values for each of the ACS component identifiers. You can specify a maximum of 42 identifiers for each type. See specific command descriptions for the valid component types for each command.

Note: The identifiers specified in Table 24. represent valid ranges of values supported by the software. Your LSM type and library configuration determine what identifier values are valid for your particular site.

Table 24. ACSLS Component Types and Identifiers

Component	Type	Identifier	Valid Values
entire library	server	none	none
ACS	acs	acs_id	acs(0−126)
LSM	lsm	lsm_id	acs(0−126), lsm(0−23),
LSM panel	panel	panel_id	acs(0−126), lsm(0−23), panel(0−19),
LSM subpanel *	subpanel	subpanel_id	acs(0−126), lsm(0−23), panel(0−19), startrow(0−41), startcolumn(0−23), endrow(0−41), endcolumn(0−23)
LSM storage cell	subpanel	cell_id	acs(0−126), lsm(0−23), panel(0−19), row(0−41), column(0−23)
* The ending row (and column) must be greater than or equal to the beginning row (and column).Only cells within the beginning and ending matrix are audited: the matrix starts with the beginning row and beginning column and extends to the ending row and ending column.			

Table 24. ACSLS Component Types and Identifiers

Component	Type	Identifier	Valid Values
CAP	cap	*cap_id*	acs(0−126), lsm(0−23), cap(0−2) An asterisk (*) in the *cap_id* does the following: acs,lsm,* – causes ACSLS to select the highest priority available CAP in the LSM. acs,* – causes ACSLS to select the highest priority available CAP in the ACS. * – for an enter request causes ACSLS to select the CAP in the LSM with the most free cells. * – for an eject request causes ACSLS to select the highest priority CAP in each ACS with a volume designated for ejection.
transport	drive	*drive_id*	acs(0−126), lsm(0−23), panel(0−19), drive(0−19)
transport type	drive	*drive_type*	10-character transport type identifier; can be any combination of numbers (0–9) or letters (A−Z). Spaces are not allowed.
port	port	*port_id*	acs(0−126), port(0−15)

Table 24. ACSLS Component Types and Identifiers

Component	Type	Identifier	Valid Values
volume serial number of a data or scratch volume or a cleaning cartridge	volume, scratch, clean	*vol_id*	Six-character identifier consisting of any combination of numbers (0–9), letters (A–Z, a–z or mixed case), dollar sign ($), pound sign (#), and spaces ( ). Use single or double quotes to enclose volsers with leading or trailing spaces. *Do not* specify volsers with embedded spaces.
range of volume serial numbers	volume	*volrange*	Specifies an ascending range of volumes separated by a dash (-). Specify only the right-most numeric portions of the volsers as the range. All preceding characters *must* be identical.
volume media type	media	*media_type*	10-character media type identifier; can be any combination of numbers (0–9) or letters (A–Z). Spaces are not allowed.
volume owner	owner	*owner_id*	
scratch pool	pool	*pool_id*	Decimal number (0–65534). Specifying an asterisk (*) for the *pool_id* reassigns the volume to its current *pool_id*.
ACSLS request	request	*request_id*	Unique decimal number (0–65535) assigned by ACSLS.

Table 24. ACSLS Component Types and Identifiers

Component	Type	Identifier	Valid Values
transport or volume lock	<u>loc</u>k	*lock_id*	Decimal number (0−32767)
ACSLS request	<u>re</u>quest	*request_id*	unique numeric (0−65535) request identifier assigned by ACSLS.

**Common
Command Error
Messages**

A common error message appears if ACSLS rejects a command because of a syntax error, invalid identifier, type, or option, process failure, database error, and so forth. For more information on common error messages, see *ACSLS Messages*.

If you enter a command that you cannot use, the following message appears:

```
Command access denied.
```

If you specify a volume that you cannot access, the following message appears:

```
Volume access denied.
```

audit

The <u>au</u>dit command updates the ACSLS database to match the actual inventory of library volumes.

Format

<u>au</u>dit *cap_id type identifier...*

Options

cap_id

specifies the CAP that ACSLS uses to eject any errant volumes. You can specify a particular cap or enter an asterisk (*), which causes ACSLS to select the highest priority CAP.

You can specify multiple ACSs only if CAP priority has been set in each ACS. You must specify an asterisk for the *cap_id* to allow automatic selection of a CAP in each ACS.

A single LSM audit waits until ACSLS updates the database, then reserves the CAP if required to eject errant volumes.

type identifier
>   specifies a library component. Table 25. lists the
>   components you can audit.

Table 25. Valid Components for Audit

Library Component	*type*	*identifier*
entire library	<u>ser</u>ver	none
ACS	<u>ac</u>s	*acs_id*
LSM	<u>l</u>sm	*lsm_id*
LSM panel	<u>pa</u>nel	*panel_id*
LSM subpanel	<u>su</u>bpanel	*subpanel_id*

You can specify multiple ACSs, LSMs, panels, or
subpanels in a single audit request. You cannot specify
overlapping subpanels.

You can specify multiple ACSs only if CAP priority has
been set in each ACS. You must specify an asterisk for the
cap_id to allow automatic selection of a CAP in each
ACS.

Regardless of the order in which you specify multiple
components, however, the audit processes these
components in ascending order by *acs_id*, *lsm_id*
panel_id, *subpanel_id*. For example, the audit will
process panel 0,0,9 before subpanel 0,0,10,1,7 even if you
specify this subpanel first.

Usage   An audit updates the ACSLS database to match the actual
inventory of library volumes. You run an audit to:

- Create volume information in the database if you do not
  enter volumes through the CAP. For example, run an audit
  if you add an LSM to your library, open the LSM door,
  and manually add volumes to the LSM.

- Resolve discrepancies between the library and the
  database. For example, run an audit if you open an LSM
  door and manually remove volumes instead of ejecting
  them through the CAP. The audit deletes information for
  the removed volumes from the database.

- View the contents of cells specified by the audit (you must
  have a display monitor connected to the LSM robot's
  vision system).

Note: Audit recognizes particular models of cleaning cartridges
and will record them in the database as cleaning cartridges.
However, the audit command does not set the max_uses for new
cleaning cartridges it encounters. You will have to set the
max_uses for these using the `set clean` command on pages 271
and 477.

Note: When audit cannot find a volume in any recorded
location (cell and possibly drive), audit will delete all
information about the volume from the database, including
volume information and customer-supplied information about
access control, scratch status, lock IDs, and pool IDs. If audit
later finds the volume in another location, it re–adds the volume
information, but the customer-supplied information is lost.

An audit ejects errant volumes and deletes their information
from the database. An errant volume has:

- An external label that duplicates one already scanned.

- A missing or unreadable external label and no virtual label.

- An invalid media type.

Audits only apply to LSM storage cells, not to transports or CAPs. ACSLS displays cmd_proc messages during the audit and records any database changes from the audit in the event log. If volume statistics logging is enabled, ACSLS records additional volume found and volume not found messages in the acsss_stats.log. See "Logging Volume Statistics" in Chapter 12, *Reporting and Logging,* for more information.

Hint: Use the following guidelines for running an audit:

- The ACS or LSM being audited must be either online or in diagnostic state. Normal library processing (including mounts and dismounts) can occur during an audit, although library processing slows down the audit.

  An audit in diagnostic state is faster because the library is unavailable to client applications. For ACSs or LSMs in diagnostic state, however, if the audit finds a discrepancy between the library and the database, the audit uses the first scan of the affected cells and does **not** recheck them. For online ACSs or LSMs, if the audit finds a discrepancy, it rechecks the affected cells.

- After you start an audit on an entire LSM, you cannot start another audit on the same LSM. You must cancel and rerun the audit.

- You can cancel any audit request, but ACSLS will always finish auditing the current panel or subpanel. When you cancel an audit, some or all of the volumes marked for ejection may not be ejected. When you cancel an audit, volumes already ejected are not re-entered.

Caution: If you cancel an audit or if there is a library or ACSLS hardware or software failure during the audit, you must rerun the same audit. Volumes marked for ejection but not actually ejected during the first audit are no longer in the database and are not under ACSLS control.

Examples   To audit the entire library and specify the highest priority CAP in each ACS for ejections:

```
audit * server
```

To audit LSM 0,1 and specify CAP 0,1,1 for ejections:

```
audit 0,1,1 lsm 0,1
```

To audit panel 10 of LSM 0,1 and specify the highest priority CAP in LSM 0,1 for ejections:

```
audit 0,1,* panel 0,1,10
```

Notes   A cell cannot be audited if it is reserved by another process. If a cell is reserved, ACSLS rechecks the database until the cell becomes available up to a maximum of 60 retries. If the cell is still unavailable, the audit skips the cell and logs a message to the event log.

See Also

For information about...	See...
Guidelines for auditing the library	"Auditing the Library" on page 200
Cancelling a command	cancel command on page 375
Displaying CAP status	query cap command on page 433
Displaying ACSLS and library status	query server command on page 465
Displaying ACS status	query acs command on page 431
Displaying LSM status	query lsm command on page 447
Setting CAP selection priority	set cap priority command on page 474
Setting CAP mode (manual or automatic)	set cap mode command on page 471
Changing the state of a library component	vary command on page 498

**Command Area
Messages**

Success Messages   The following message appears when the audit completes
                          successfully.

                          `Audit: Audit completed, Success.`

                          In addition, one of the following messages appears to confirm
                          which component was audited:

                          `Audit: Audit of storage server, valid`
                          `Audit: Audit of ACS, ` *`acs_id`*`, ` *`status`* ` valid`
                          `Audit: Audit of LSM, ` *`lsm_id`*`, ` *`panel_id`*`, valid`
                          `Audit: Audit of panel, ` *`panel_id`*`, valid`
                          `Audit: Audit of subpanel, ` *`subpanel_id`*`, valid`

                          Hint: If you audit an invalid cell location (that is, just above or
                          below a transport or on an extra column), ACSLS returns a
                          success message to allow audits to work with PTPs.

Intermediate   Intermediate messages consist of a two-line display with the
Messages   following first line:

                          `Audit: Intermediate response: Audit activity.`

                          One of the following messages appears on the second line.

`Audit: Cartridge ejected, unreadable label.`

                          Explanation: ACSLS ejected a cartridge that had:

                          • No external label

                          • No virtual label, or

                          • An unreadable label

`Audit: Cartridge ` *`vol_id`* ` ejected, duplicate label.`

                          Explanation: ACSLS ejected with a duplicate external label
                          within the range of cells being audited.

                          Variable: *`vol_id`* is the volume with the duplicate label.

Audit: Cartridge *vol_id* found.

> **Explanation:** The audit found a volume in the ACS that is not in the ACSLS database. The audit added the volume to the database.
>
> **Variable:** *vol_id* is the volume added to the database.

Audit: Cartridge *vol_id* not found.

> **Explanation:** A volume listed in the ACSLS database is not in the ACS. The volume is deleted from the database.
>
> **Variable:** *vol_id* is the volume deleted from the database.

Audit: Cartridge ejected, invalid media type

> **Explanation:** ACSLS ejected a cartridge with an invalid media type.

Error Messages

Audit in progress.

> **Explanation:** ACSLS did not start the audit because another audit for the same LSM is in progress.

CAP *cap_id* in use.

> **Explanation:** The CAP specified for the audit is in use.
>
> **Variable:** *cap_id* is the CAP in use.

Multiple ACS audit.

> **Explanation:** The audit failed because the audit command specified multiple ACSs without specifying an * for the *cap_id*.

```
Not in same ACS.
```

> **Explanation:** The audit failed because the *cap_id* and the
> *identifier* specified are not in the same ACS.
>
> **Variable:**
>
> - *cap_id* is the CAP specified for the audit.
>
> - *identifier* is the library component specified for the
>   audit.

Display Area Messages

```
cap_id Remove cartridges from CAP.
```

> **Explanation:** The audit filled the CAP with ejected cartridges.
> Empty the CAP, then close it to continue the audit.
>
> **Variable:** *cap_id* is the CAP that contains the ejected
> cartridges.

```
CAP cap_id: Place magazines in CAP.
```

> **Explanation:** The CAP requires magazines for the audit. Open
> the CAP, place magazines inside, then close the CAP.
>
> **Variable:** *cap_id* is the CAP that requires magazines.

```
CAP cap_id: No CAP available, waiting...
```

> **Explanation:** No CAP is available to eject cartridges.
>
> **Variable:** The *cap_id* appears as it was specified in the audit
> command:
>
> - *acs, lsm, cap* if the audit command explicitly specified
>   the CAP.
>
> - *acs, lsm, * * if the audit command specified the CAP as
>   *acs, lsm, *.*
>
> - *acs, *, * * if the audit command specified the CAP as
>   *acs, * or *.*

cancel

The <u>can</u>cel command cancels a current or pending request.

Format

<u>can</u>cel *request_id*

Options

request_id
    specifies the identifier of the request to cancel.

Usage   Use the <u>can</u>cel command to cancel current or pending request
issued by an <u>au</u>dit, <u>def</u>ine <u>poo</u>l, <u>del</u>ete <u>poo</u>l, <u>ej</u>ect, <u>en</u>ter,
<u>loc</u>k, <u>q</u>uery, <u>set</u>, or <u>v</u>enter command or client application.
Use the <u>q</u>uery <u>req</u>uest command to display the ID of the
request you want to cancel.

You can cancel an audit of a server, ACS, or LSM. Because
ACSLS internally translates server, ACS, or LSM audits into a
series of panel audits, ACSLS completes the audit of the current
panel before cancelling the remainder of the audit. You cannot
cancel an audit of a panel or subpanel. When you cancel an
audit, volumes already ejected are not re-entered.

Caution: If you cancel an audit or if there is a library or
ACSLS hardware or software failure during the audit, you must
rerun the same audit. Volumes marked for ejection but not
actually ejected during the first audit are no longer in the
database and are not under ACSLS control.

Hint: You must enter a <u>can</u>cel command from a different
cmd_proc than the cmd_proc that issued the request you want to
cancel.

The <u>cance</u>l command immediately cancels any pending requests and handles current requests as follows:

<u>au</u>dit

Because ACSLS internally translates server, ACS, or LSM audits into a series of panel audits, ACSLS completes the audit of the current panel before cancelling the remainder of the audit.

Caution: If you cancel an audit or if there is a library or ACSLS hardware or software failure during the audit, you must rerun the same audit. Volumes marked for ejection but not actually ejected during the first audit are no longer in the database and are not under ACSLS control.

<u>def</u>ine <u>poo</u>l

ACSLS stops defining scratch pools but does not delete any scratch pools already defined.

<u>del</u>ete <u>poo</u>l

ACSLS stops deleting scratch pools but does not redefine any scratch pools already deleted.

<u>e</u>ject

ACSLS stops the ejection and the cmd_proc displays a message to remove any cartridges already ejected, which are not reentered.

<u>en</u>ter

ACSLS stops the enter and, if any cartridges remain in the CAP, cmd_proc displays a message to remove these cartridges. Any volumes already entered into the LSM are not ejected.

<u>loc</u>k

Resource locking by the specified request is stopped. If the request has not yet acquired all specified resources, none of the resources are locked.

<u>q</u>uery

ACSLS cancels the query.

---

set
> For <u>set</u> <u>cap</u>, ACSLS stops setting CAP attributes, but does not change any attributes already set.
>
> For <u>set</u> <u>sc</u>ratch or <u>set</u> <u>clean</u> requests, ACSLS stops setting scratch volume or cleaning cartridge attributes, but does not change any attributes already set.

<u>ve</u>nter
> ACSLS stops the enter and, if any cartridges remain in the CAP, cmd_proc displays a message to remove these cartridges. Any volumes already entered into the LSM are not ejected.

Examples   To display request IDs for all current and pending requests:

query request all

Example output of <u>q</u>uery <u>req</u>uest <u>al</u>l:

```
Identifier    Command  Status

13            enter    Current
15            query    Pending
```

To cancel request 13 (current enter request) in the example above:

cancel 13

Notes   None.

See Also

For information about...	See...
Updating the ACSLS database to match the actual inventory of library volumes	<u>au</u>dit command on page 367
Creating or modifying scratch pools	<u>def</u>ine <u>poo</u>l command on page 383
Deleting empty scratch pools	<u>del</u>ete <u>poo</u>l command on page 386
Ejecting volumes from the library	<u>ej</u>ect command on page 394
Making a CAP (manual mode) ready to enter labelled cartridges into the library	<u>en</u>ter command on page 400
Locking (dedicating) transports and volumes to your current lock ID	<u>loc</u>k command on page 408
Displaying the status of a library component	<u>q</u>uery commands on page 429
Setting various attributes of different library components	<u>set</u> commands on page 470
Making a CAP ready to enter unlabeled cartridges into the library	<u>v</u>enter command on page 507

**Command Area
Messages**

Success Messages

Request *request_id* cancelled.

> **Explanation:** ACSLS cancelled the requested command.
>
> **Variable:** *request_id* is the request identifier of the cancelled command.

Intermediate
Messages

None.

Error Messages

Request *request_id* can not be cancelled: *status*.

> **Explanation:** ACSLS cannot cancel the specified command.
>
> **Variable:**
>
> - *request_id* is the request identifier of the command that ACSLS cannot cancel.
>
> - *status* is one of the following:
>
>   Request identifier *request_id* invalid.
>
>   > The <u>can</u>cel command specified an invalid request identifier.
>
>   Request identifier *request_id* not found.
>
>   > The <u>can</u>cel command specified an request identifier for a request that is not current or pending.

**Display Area
Messages**

None.

clear lock

The <u>clear</u> <u>loc</u>k command removes all active and pending locks on a specified transport or volume.

Format

<u>clear</u> <u>loc</u>k *type identifier*

Options

type identifier
>   specifies a library component. Table 26. lists the components whose resource locks you can clear.

Table 26.   Valid Components for Clear Lock

Library Component	*type*	*identifier*
transport	<u>dr</u>ive	*drive_id*
volume	<u>vo</u>lume	*vol_id*

Usage

Use the <u>clear</u> <u>loc</u>k command to remove all active and pending locks on a specified transport or volume. Your current lock ID must either be 0 or it must match the lock ID of the transport or volume.

The <u>unl</u>ock command removes only active locks on transports or volumes. You can, however, use the <u>unl</u>ock command to remove active locks on all transports or all volumes.

Note: The <u>clear</u> <u>loc</u>k command always resets your lock ID to 0.

Examples

To clear all locks for transport 1,1,5,2:

>   **clear lock drive 1,1,5,2**

To clear all locks for volume NN0108:

>   **clear lock volume NN0108**

Notes   You cannot cancel a <u>cl</u>ear <u>loc</u>k command.

See Also

For information about...	See...
Locking transports and volumes	<u>loc</u>k command on page 408
Displaying the lock status of a transport or volume	<u>q</u>uery <u>loc</u>k command on page 444
Removing active locks for transports or volumes	<u>un</u>lock command on page 495
Setting your lock ID	<u>set</u> <u>loc</u>k command on page 480
Displaying your lock or user ID	<u>sh</u>ow command on page 486

**Command Area
Messages**

Success Messages   The following message appears when a `clear` request succeeds:

Clear: Completed, Success.

In addition, for each *identifier* in the request, one of the
following messages appears depending on the library component
(*type*):

Clear: Drive *drive_id* all locks cleared.
Clear: Volume *vol_id* all locks cleared.

Intermediate   None.
Messages

Error Messages

Clear: Clear lock of drive *drive_id* failed,
                 Drive identifier *drive_id* available.

Explanation: ACSLS cannot clear locks because the specified
transport is not locked.

Variable: *drive_id* is the identifier of the specified transport.

Clear: Clear lock of volume *vol_id* failed,
                 Volume identifier *vol_id* available.

Explanation: ACSLS cannot clear locks because the specified
volume is not locked.

Variable: *vol_id* is the identifier of the specified volume.

**Display Area   None.
Messages**

define pool

The <u>def</u>ine <u>poo</u>l command creates or modifies scratch pools.

Format

<u>def</u>ine <u>poo</u>l *low_water_mark high_water_mark*
pool_id...[<u>ov</u>erflow]

Options

low_water_mark
> is the low volume warning threshold. If the scratch
> volume count falls below this threshold, ACSLS logs a
> warning message in the event log. Valid values are 0 to
> $2^{31}-1$. The default is 0.

high_water_mark
> is the high volume warning threshold. If the scratch
> volume count reaches or exceeds this threshold, ACSLS
> logs a warning message in the event log. This value must
> be greater than the value for *low_water_mark*.

pool_id
> specifies the pool identifier. Pool 0 is the common scratch
> pool, which always exists. You can modify the common
> scratch pool attributes.

<u>ov</u>erflow
> specifies that if this pool cannot satisfy <u>mou</u>nt <u>sc</u>ratch
> requests, ACSLS will select volumes from the common
> pool (Pool 0).

Usage Use the <u>def</u>ine <u>poo</u>l command to create or modify scratch
pools.

Examples   To define a low threshold of 0, a high threshold of 600, and
                 overflow for new pool 1:

`define pool 0 600 1 overflow`

To define a low threshold of 0 , a high threshold of 600, and no
overflow for existing pool 5:

`define pool 0 600 5`

Notes   Scratch pools are not owned by one client application or user ID.
              You can, however, use volume access control to restrict access
              for specific scratch volumes.

See Also

For information about...	See...
Guidelines and procedures for managing scratch volumes	"Managing Scratch Volumes" on page NO TAG
Cancelling a command	cancel command on page 375
Deleting empty scratch pools	delete pool command on page 386
Mounting a scratch volume on a transport	mount * command on page 418
Displaying scratch pool attributes	query pool command on page 455
Setting or clearing volume scratch attributes	set scratch command on page 483

**Command Area
Messages**

Success Messages The following message appears when a <u>def</u>ine <u>poo</u>l command
succeeds:

```
Define:  Define completed, Success.
```

In addition, the following message appears for each created or
modified pool:

```
Define: Pool pool_id created.
```

Intermediate None.
Messages

Error Messages None.

**Display Area
Messages**

```
Pool pool_id: low water mark warning.
```

> **Explanation:** The number of volumes in the specified scratch
> pool is less than or equal to the low volume threshold.

> **Variable:** *low_water_mark* is the low volume threshold of the
> specified scratch pool.

```
Pool pool_id: high water mark warning.
```

> **Explanation:** The number of volumes in the specified scratch
> pool is greater than or equal to the high volume threshold.

> **Variable:** *high_water_mark* is the high volume threshold of
> the specified scratch pool.

delete pool

The <u>del</u>ete <u>poo</u>l command deletes empty scratch pools.

Format

<u>del</u>ete <u>poo</u>l *pool_id*...|<u>al</u>l

Options

pool_id
 specifies the pool ID.

 Pool 0 is the common pool, which you cannot delete.

<u>al</u>l   specifies all empty scratch pools.

Usage   Use the <u>del</u>ete <u>poo</u>l command to delete empty scratch pools. If a pool contains scratch volumes, you must reassign these volumes to another pool before deleting the first pool. If a scratch volume is mounted, it becomes a data volume but remains in its scratch pool. Use the <u>set</u> <u>sc</u>ratch <u>of</u>f command to reassign the data volume to the common pool.

Examples   To delete all empty scratch pools**:**

`delete pool all`

Hint: Only the empty pools will be deleted; pools with volumes assigned will not be affected.

To delete scratch pool 1:

   1.   Query scratch pool 1:

`query scratch 1`

```
1998-06-30    09:35:30           Scratch Status
Scratch Pool  Identifier    Home Location    Status     Type

1             34813         0,0.1,8,8        home       3480
1             34815         0,0.1,8,1        home       3480
```

Pool 1 has two volumes, 34813 and 34815.

   2.   Empty pool 1 by reassigning its volumes to pool 5:

`set scratch 5 348013 348015`

   3.   Delete pool 1:

`delete pool 1`

Notes   None.

See Also

For information about...	See...
Guidelines and procedures for managing scratch volumes	"Managing Scratch Volumes" on page NO TAG
Cancelling a command	cancel command on page 375
Creating or modifying scratch pools	define pool command on page 383
Displaying scratch pool attributes	query pool command on page 455
Displaying the location and media type of a volume	query volume command on page 467
Setting or clearing volume scratch attributes	set scratch command on page 483

Command Area Messages

Success Messages

The following message appears when a delete pool command completes successfully:

```
Delete: Delete completed, Success.
```

In addition, the following message appears for each deleted pool.

```
Delete: Pool pool_id deleted.
```

Intermediate Messages

None.

Error Messages

```
Delete: Pool pool_id failed, Pool not empty.
```

Explanation: ACSLS cannot delete the scratch pool because it is not empty.

Variable: *pool_id* is the identifier of the requested pool.

dismount

The <u>dis</u>mount command dismounts a volume from a transport.

Format

<u>dis</u>mount *vol_id drive_id* [<u>f</u>orce]

Options

vol_id
   specifies of the volume identifier.

drive_id
   specifies the transport.

<u>f</u>orce
   forces a dismount of the actual volume in the specified
   transport, even if the *vol_id* of the volume in the transport
   does not match the specified *vol_id*.

   This option also forces a dismount even if the transport is
   not unloaded.

Usage   Use the <u>dis</u>mount command to dismount a volume from a
   transport and place the volume in an available storage cell.

dismount   Use the <u>dis</u>mount command without the <u>f</u>orce option to
   dismount a specified volume from a specified transport. A
   successful unforced dismount requires the following:

   • The transport must be online

   • The *vol_id* of the volume in the transport must match the
     vol_id you specify on the <u>dis</u>mount command

   • The transport must be unloaded

dismount force   Use the <u>dis</u>mount command with the <u>f</u>orce option to force a dismount of the actual volume mounted in a specified transport. The *vol_id* of the volume in the transport does *not* have to match the *vol_id* you specify on the <u>dis</u>mount command. In addition, if the the volume is not ready for dismounting, ACSLS forces the transport to automatically rewind, unload, and dismount the volume. The transport must be online.

You can use the <u>f</u>orce option to dismount a volume with an unreadable or unknown label or a volume that a client application did not dismount. Note that ACSLS returns the volume to an available storage cell, even if the label is unreadable or missing.

Caution: Because a forced dismount immediately rewinds and unloads the cartridge in the transport specified, the request may result in a read failure to an application using the cartridge.

Examples

To dismount volume EDU200 from transport 0,1,10,2:

```
dismount EDU200 0,1,10,2
```

Notes   None.

See Also

For information about...	See...
Cancelling a command	<u>can</u>cel command on page 375
Displaying transport status	query <u>dr</u>ive command on page 438
Mounting a data volume on a transport	<u>mou</u>nt command on page 413
Mounting a scratch volume on a transport	<u>mou</u>nt <u>*</u> command on page 418
Ejecting volumes from the library	<u>ej</u>ect command on page 394
Displaying CAP status	query <u>cap</u> command on page 433

For information about...	See...
Making a CAP (manual mode) ready to enter labelled cartridges into the library	<u>en</u>ter command on page 400
Setting CAP selection priority	<u>set</u> <u>cap</u> <u>pri</u>ority command on page 474
Setting CAP mode (manual or automatic)	<u>set</u> <u>cap</u> <u>mode</u> command on page 471

Command Area Messages

Success Messages

`Dismount: `*`vol_id`*` dismounted from `*`drive_id`*`.`

Explanation: An unforced dismount succeeded.

Variable:

- *vol_id* is the identifier of the dismounted volume.
- *drive_id* is the identifier of the specified transport.

`Dismount: Forced dismount of `*`vol_id`*` from `*`drive_id`*`.`

Explanation: A forced dismount succeeded.

Variable:

- *vol_id* is the identifier of the dismounted volume.
- *drive_id* is the identifier of the specified transport.

Intermediate Messages   None.

Error Messages

`Dismount: Dismount failed, ACS acs_id full.`

> **Explanation:** ACSLS cannot dismount the volume because the ACS has no free storage cells. You must eject at least one other volume from the ACS so that ACSLS can dismount the volume from the transport.
>
> **Variable:** *acs_id* is the identifier of the ACS that contains the volume.
>
> **Note:** Only online LSMs are used in locating free cells; therefore this message can occur even when there is an LSM with free storage cells if that LSM is offline.

`Dismount: Dismount failed, Audit in progress.`

> **Explanation:** ACSLS cannot dismount the volume because an audit in progress has locked out access to the last unoccupied cell location in the ACS.

`Dismount: Dismount failed, Cartridge in drive drive_id, unreadable label`

> **Explanation:** ACSLS cannot dismount the volume because the volume either has no external label, an unreadable external label, or no virtual label. Use a forced dismount to dismount the volume.
>
> **Variable:** *drive_id* is the identifier of the specified transport.

`Dismount: Dismount failed, Drive identifier drive_id available.`

> **Explanation:** No volume is mounted in the specified transport.
>
> **Variable:** *drive_id* is the identifier of the specified transport.

Dismount: Dismount failed, Drive identifier *drive_id* in use.

> **Explanation:** ACSLS cannot dismount the volume because the cartridge is not rewound and unloaded. Either wait for the client application must either rewind and unload the cartridge, then enter a dismount command or use a forced dismount to dismount the volume.

> **Variable:** *drive_id* is the identifier of the specified transport.

Dismount: Dismount failed, Misplaced tape.

> **Explanation:** ACSLS cannot dismount the volume because the external label of the volume does not match the volume identifier in the ACSLS database. The volume identifier in the ACSLS database is updated to match the external label of the volume. Retry the dismount.

Dismount: Dismount failed, Volume not in drive.

> **Explanation:** ACSLS cannot dismount the volume because the external label of the volume does not match the volume identifier specified in the dismount. Reenter the dismount command with the correct volume identifier.

Display Area Messages   None.

eject

The <u>ej</u>ect command ejects volumes from the library. If you select the lsm_id option, you can use multiple CAPs in a single LSM to eject cartridges.

Format

<u>ej</u>ect *cap_id|lsm_id vol_id|volrange...*

Options

cap_id
> specifies the CAP used to eject the volumes.

lsm_id
> If you select the *lsm_id* option, you can use multiple CAPs that are available in a single LSM to eject cartridges. All CAPs that satisfy the requirements (such as manual, non zero priority, available) are unlocked for ejecting cartridges. You can eject cartridges through any or all the CAPs selected, and in any order. Eject initially fills the CAPs with cartridges in order of highest priority.

> Example: You have two CAPs – one with priority 2 and one with priority 5; eject fills the CAP with priority 5 status first, then the CAP with priority 2 status. If there are only enough cartridges to be ejected for one CAP, then CAP with priority 5 is filled.

vol_id|volrange
> specifies the external or virtual label types of the volume or range of volumes to eject.

Usage   Use the e̲j̲ect command to eject volumes from the library,
which removes them from ACSLS control. The robot places
the specified volume in the designated CAP, then ACSLS frees
the cell locations where the volumes were stored. Volume
information is either retained if the RETENTION_PERIOD
variable has a non–zero value, or deleted if the
RETENTION_PERIOD is set to zero. If you specify more than
a CAP full of cartridges on the e̲j̲ect command, empty the
CAP when it fills, close the CAP, and continue the ejection until
all volumes are ejected.

You can use a single e̲j̲ect command to eject multiple volumes
not in a range by specifying multiple volume IDs separated by a
space.

Hint: If your library has two connected LSMs and the PTP is
down, to successfully eject volumes, either:

- Specify a CAP in the LSM where the volume is stored.
  For example, if volume NN0100 is stored in LSM 0,0, to
  eject this volume through CAP 0,0,0:

  eject 0,0,0 NN0101

- For the *cap_id*, specify the LSM where the volume is
  stored but use a wildcard (*) for the CAP number; ACSLS
  will select the highest priority CAP in the LSM. For
  example, if volume NN0114 is stored in LSM 0,0, to eject
  this volume through LSM 0,0's highest priority CAP:

  eject 0,0,* NN0114

Examples   To eject volume NN0101 through CAP 0,0,0:

  eject 0,0,0 NN0101

To eject volume range NN0101–NN0109 through the highest
priority CAP on ACS 0:

  eject 0,* NN0101–NN0109

To eject volumes NN0101, NN0103, NN0105, and NN0107
through the highest priority CAP on ACS 0:

eject 0,* NN0101 NN0103 NN0105 NN0107

To use multiple CAPs for ejecting cartridges in an LSM 1,2:

eject 1,2 RB1000-RB2000

Notes   Make sure you remove all ejected volumes from the CAP. You
must complete the ejection by unloading all ejected cartridges
and closing the CAP door before you can use the CAP for
another operation (such as an enter or audit).

See Also

For information about...	See...
Guidelines and procedures for ejecting volumes	"Ejecting Volumes" on page 259
Cancelling a command	cancel command on page 375
Displaying the location and media type of a volume	query volume command on page 467
Displaying transport status	query drive command on page 438
Dismounting a volume from a transport	dismount command on page 389
Displaying CAP status	query cap command on page 433
Making a CAP (manual mode) ready to enter labelled cartridges into the library	enter command on page 400
Setting CAP selection priority	set cap priority command on page 474
Setting CAP mode (manual or automatic)	set cap mode command on page 471

**Command Area
Messages**

Success Messages

> Eject: Eject complete, *nn* cartridges ejected
>   Eject: *vol_id* ejected from *cap_id*

> **Explanation:** ACSLS ejected the specified volumes.

> **Variable:**

> - *nn* is the number of cartridges ejected.

> - *vol_id* is the volume identifier of the ejected volume.

> - *cap_id* is the CAP that contains the ejected volume.

Intermediate   None.
Messages

Error Messages

> Eject: *vol_id* Eject failed, CAP *cap_id* full.

> **Explanation:** A volume was not ejected because the CAP is
> full.

> **Variable:**

> - *vol_id* is the volume identifier of the volume that was not
>   ejected.

> - *cap_id* is the CAP specified for the ejection.

Eject: *vol_id* Eject failed, CAP *cap_id* in use.

> **Explanation:** A volume was not ejected because the CAP is in use.
>
> **Variable:**
>
> - *vol_id* is the volume identifier of the volume that was not ejected.
>
> - *cap_id* is the CAP specified for the ejection.

Eject: *vol_id* Eject failed, Misplaced tape.

> **Explanation:** ACSLS cannot eject the volume because the external label of the volume does not match the database's volume identifier for the storage cell. The database updates the volume identifier, media type, and cleaning cartridge attribute for the volume in the storage cell.
>
> **Variable:** *vol_id* is the volume identifier of the volume that was not ejected.

Eject: *vol_id* Eject failed, Not in same ACS.

> **Explanation:** A volume was not ejected because it is not in the ACS specified in the *cap_id*.
>
> **Variable:** *vol_id* is the volume identifier of the volume that was not ejected.

Eject: *vol_id* Eject failed, Volume identifier *vol_id* not found.

> **Explanation:** A volume was not ejected because it is not:
>
> - In the storage cell specified in the database,
>
> - In–transit, or
>
> - In a transport.
>
> ACSLS deletes the volume entry from the database.
>
> **Variable:** *vol_id* is the volume identifier that was deleted from the database.

Eject: *vol_id* Eject failed, Volume in drive.

> **Explanation:** A volume was not ejected because it is mounted in a transport.
>
> **Variable:** *vol_id* is the volume identifier of the volume that was not ejected.

Eject: *vol_id* Eject failed, Volume *vol_id* in use.

> **Explanation:** A volume was not ejected because it is reserved for use by another request.
>
> **Variable:** *vol_id* is the volume identifier of the volume that was not ejected.

Display Area Messages

CAP *cap_id* Remove cartridges from CAP.

> **Explanation:** Either the CAP is full or all requested volumes are in the CAP. Empty the CAP.
>
> **Variable:** *cap_id* is the CAP that contains the ejected volumes.

CAP *cap_id* Place magazines in CAP.

> **Explanation:** The CAP requires magazines for the ejection. Open the CAP, place magazines inside, then close the CAP.
>
> **Variable:** *cap_id* is the CAP that requires magazines.

enter

For a CAP in manual mode, the <u>en</u>ter command makes the CAP ready to enter labelled cartridges. If youselect the lsm_id option, you can use multiple CAPs in a single LSM to enter cartridges.

Format

<u>en</u>ter *cap_id*|*lsm_id*

Options

cap_id
    specifies the CAP.

lsm_id
    If you select the *lsm_id* option, you can use multiple CAPs that are available in a single LSM to enter cartridges. All CAPs that satisfy the requirements (such as manual, non zero priority, available) are unlocked for entering cartridges. You can enter cartridges through any or all the CAPs selected, and in any order. venter is not valid and returns a CAP invalid error.

Usage

Use the <u>en</u>ter command to make a manual mode CAP ready to enter labelled cartridges.

Examples

To make CAP 0,0,2 ready to enter cartridges:

enter 0,0,2

To make the highest priority CAP in LSM 0,0 ready to enter cartridges:

enter 0,0,*

To use multiple CAPs for entering cartridges in an LSM 1,2:

enter 1,2

Notes Cartridges being entered into an LSM must be compatible with that LSM. For example, only T9840, T9940, and LTO cartridges can be entered into an L5500 LSM.

See Also

For information about...	See...
Guidelines and procedures for entering cartridges	"Entering Cartridges" on page NO TAG
Cancelling a command	<u>can</u>cel command on page 375
Displaying CAP status	<u>q</u>uery <u>cap</u> command on page 433
Setting CAP selection priority	<u>set</u> <u>cap</u> <u>pri</u>ority command on page 474
Setting CAP mode (manual or automatic)	<u>set</u> <u>cap</u> <u>mod</u>e command on page 471
Making a CAP ready to enter unlabeled cartridges into the library	<u>ve</u>nter command on page 507
Mounting a data volume on a transport	<u>mou</u>nt command on page 413
Creating or modifying scratch pools	<u>def</u>ine <u>poo</u>l command on page 383
Mounting a scratch volume on a transport	<u>mou</u>nt <u>*</u> command on page 418
Ejecting volumes from the library	<u>ej</u>ect command on page 394

**Command Area
Messages**

Success Messages

After all labelled cartridges have been entered, the following
message appears, with the second line of the message repeated
for each cartridge successfully entered:

```
Enter: Enter complete, nn cartridges entered
Enter: vol_id Entered through cap_id
```

- *nn* is the total number of cartridges entered

- *vol_id* is the volume identifier of the entered cartridge

- *cap_id* is the CAP used to enter the cartridges

Intermediate
Messages

None.

Error Messages

```
Enter: vol_id Enter failed, ACS acs_id full.
```

Explanation: A cartridge was not entered because the ACS has
no free storage cells. You must eject at least one volume from
the ACS so that ACSLS can enter the volume.

Variable:

- *vol_id* is the external label of the volume that was not
  entered.

- *acs_id* is the identifier of the ACS that has no free
  storage cells.

  Note: ACSLS only searches online LSMs for free cells;
  this message can occur even if offline LSMS have free
  cells.

Enter: *vol_id* Enter failed, Audit in progress.

> **Explanation:** A cartridge was not entered because an audit has locked out access to a cell location required for the enter.
>
> **Variable:** *vol_id* is the external label of the volume that was not entered.

Enter: *vol_id* Enter failed, CAP *cap_id* in use.

> **Explanation:** A cartridge was not entered because the specified CAP is in use for auditing, ejecting cartridges, or another enter process.
>
> **Variable:**
>
> - *vol_id* is the external label of the volume that was not entered.
>
> - *cap_id* is the in-use CAP.

Enter: *vol_id* Enter failed, Duplicate label.

> **Explanation:** A cartridge was not entered because the volume identifier of a cartridge in the CAP already exists in the ACSLS database.
>
> **Variable:** *vol_id* is the external label of the volume that was not entered.

Enter: Enter failed, Unreadable label.

> **Explanation:** A cartridge was not entered because the volume either has no external label or an unreadable external label.

Enter: *vol_id* Enter failed, Unknown media type label.

> **Explanation:** A cartridge was not entered because the cartridge does not have a media identifier on its externals label.
>
> **Variable:** *vol_id* is the external label of the volume that was not entered.

Display Area
  Messages

CAP *cap_id:* Place cartridges in CAP.

> **Explanation:** The CAP is ready for cartridge entry. Open the CAP and enter cartridges.
>
> **Variable:** *cap_id* is the CAP used to enter cartridges.

CAP *cap_id:* Remove cartridges from CAP.

> **Explanation:** One or more cartridges cannot be entered.
>
> **Variable:** *cap_id* s the CAP used to enter cartridges. Open the CAP and remove the cartridges.

CAP *cap_id:* CAP *cap_id* Place magazines in CAP.

> **Explanation:** The CAP uses magazines for cartridge entry. Load cartridges in the correct magazine, open the CAP, and insert the magazines.
>
> **Variable:** *cap_id* s the CAP used to enter cartridges.

idle

The <u>idle</u> command stops ACSLS from processing new requests.

Format

<u>idle</u> [<u>f</u>orce]

Hint: You *must* enter the full command name for the <u>idle</u> command. ACSLS will reject all other forms of the command, such as i, id, or idl.

Options

<u>f</u>orce
> forces termination of new request processing.

Usage   Use the <u>idle</u> command to stop ACSLS from processing new requests. For example, you idle ACSLS before doing maintenance or before terminating ACSLS.

idle   Entering an <u>idle</u> command without the <u>f</u>orce option puts ACSLS in the idle-pending state. ACSLS completes current and pending requests (except pending lock requests, which are cancelled) and rejects new requests except those listed in "Notes." ACSLS then goes to idle state and does not process subsequent requests until restarted.

idle force   Entering an <u>idle</u> command with the <u>f</u>orce option puts ACSLS in the idle state. ACSLS cancels all current and pending requests and rejects new requests except those listed in "Notes." ACSLS does not process subsequent requests until restarted. Because ACSLS does not complete current requests, forcing ACSLS to idle state may leave the database in an inconsistent state with the hardware, which requires an audit to correct.

Hint: Depending on the current requests processing when you enter an <u>idle</u> <u>f</u>orce, the event log may report process failures. If so, vary the affected LSMs offline and back online. See "Vary" on page 498 for information about the <u>va</u>ry command.

Examples

To put ACSLS in idle-pending state:

idle

To force ACSLS to idle state:

idle force

Notes

In either idle or idle-pending state, ACSLS accepts new requests for the <u>can</u>cel, <u>idle</u>, <u>q</u>uery, <u>st</u>art, and <u>va</u>ry requests.

See Also

For information about...	See...
Stopping ACSLS	"Stopping ACSLS" on page 7
Restarting ACSLS	"Starting ACSLS" on page 6
Displaying the status of a library component	<u>q</u>uery commands on page 429
Starting ACSLS request processing	<u>st</u>art command on page 488
Changing the state of a library component	<u>va</u>ry command on page 498

Command Area Messages

Success Messages

The following message appears when ACSLS request processing stops.

```
ACSLM Request Processing Stopped: Success.
```

Intermediate Messages

None.

Error Messages

`ACSLM Request Processing Stopped:` *status*

Explanation: ACSLS did not stop processing requests.

Variable: *status* is the reason for the failure. For more information on common status messages, see *ACSLS Messages*.

Display Area Messages

`Server system idle.`

Explanation: Request processing has stopped, and ACSLS is in idle state.

`Server system idle is pending.`

Explanation: ACSLS is processing current or pending requests; idle state is pending.

lock

The l̲o̲c̲k command locks a volume or transport to a lock ID that ACSLS assigns.

Format

l̲o̲c̲k *type identifier*...[w̲ait]

Options

type identifier
> specifies a library component. Table 27. lists the components that you can lock. You can specify either a transport or a volume but not both in a single Lock command. You can, however, use the same Lock ID for both transports and volumes.

Table 27. Valid Components for Lock

Library Component	*type*	*identifier*
transport	d̲r̲ive	*drive_id*
volume	v̲o̲lume	*vol_id*

w̲ait
> specifies that the lock is pending if the component is unavailable (locked or in use). ACSLS then locks the component when it is available. You can clear or cancel a pending lock request. Idling ACSLS also cancels a pending lock request.

Usage
Use the l̲o̲c̲k command to lock a volume or transport to a lock ID that ACSLS assigns. You can only lock available (not locked or in use) volumes or transports.

Note: When you enter a l̲o̲c̲k command to lock a volume or transport, ACSLS assigns a lock ID to the volume or transport and then changes your lock ID to the lock ID of the volume or

transport. You cannot use the <u>set</u> <u>loc</u>k command to set your lock ID and then use the <u>loc</u>k command to lock a volume or transport with the lock ID that you set with <u>set</u> <u>loc</u>k.

Examples   To lock transport 0,1,10,2:

> `lock drive 0,1,10,2`

To lock volume EDU445:

> `lock volume EDU445`

Notes   None.

See Also

For information about...	See...
Removing all active or pending locks on a specified transport or volume	<u>clear</u> <u>loc</u>k command on page 380
Displaying the lock status of a transport or volume	<u>q</u>uery <u>loc</u>k command on page 444
Removing active locks on transports or volumes	<u>un</u>lock command on page 495
Setting your lock ID	<u>set</u> <u>loc</u>k command on page 480
Displaying your lock or user ID	<u>sh</u>ow command on page 486

Command Area Messages

Success Messages

The following message appears when a <u>loc</u>k request succeeds:

```
Lock: Lock completed, Success.
```

In addition, for each identifier in the request, one of the following messages appears:

```
Lock: Drive drive_id locked under lock_id lock_id.
```

```
Lock: Volume vol_id locked under lock_id lock_id.
```

Where:

- *drive_id* is the locked transport.

- The *vol_id* is the volume identifier of the locked volume.

- *lock_id* is the lock ID.

Intermediate Messages

None.

Error Messages

One of the following messages appears if the <u>loc</u>k request fails:

```
Lock: Lock of drive drive_id failed, Drive in use.
```

> **Explanation:** ACSLS cannot lock the specified transport because the transport is already locked or in use.
>
> **Variable:** *drive_id* is the transport that ACSLS cannot lock.

```
Lock: Lock of drive drive_id failed, Lock failed.
```

> **Explanation:** ACSLS cannot lock the specified transport. Reenter the <u>loc</u>k command with the correct syntax and transport identifier.
>
> **Variable:** *drive_id* is the transport that ACSLS cannot lock.

Lock: Lock of volume *vol_id* failed, Volume in use.

> **Explanation:** ACSLS cannot lock the specified volume because the volume is already locked or in use.
>
> **Variable:** *vol_id* is the volume that ACSLS cannot lock.

Lock: Lock of drive *vol_id* failed, Lock failed.

> **Explanation:** ACSLS cannot lock the specified volume. Reenter the lock command with the correct syntax and volume identifier.
>
> **Variable:** *vol_id* is the volume that ACSLS cannot lock.

Display Area Messages   None.

logoff

The <u>log</u>off command exits from a cmd_proc.

Format

    <u>log</u>off

Options   None.

Usage   Use the <u>log</u>off command to exit from cmd_proc. If you are running an interactive (window) cmd_proc, <u>log</u>off also quits the cmd_proc window.

Examples   To exit a cmd_proc:

    logoff

Notes   <u>log</u>off exits from cmd_proc only, is valid in any ACSLS state, and does not affect ACSLS operations.

See Also

For information about...	See...
Starting a cmd_proc	"Starting a cmd_proc" on page NO TAG
Using a cmd_proc	"Using a cmd_proc" on page 9
Stopping ACSLS	"Stopping ACSLS" on page 7
Starting ACSLS	"Starting ACSLS" on page 6

Command Area Messages   None.

Display Area Messages   None.

mount

The mount command mounts a data volume.

Format

mount *vol_id drive_id* [bypass] [readonly]

Options

vol_id
>   specifies the volume.

drive_id
>   specifies the transport.

bypass
>   overrides some of the checks that ACSLS does before trying to mount a volume. For more information, see "Mount Bypass" on page 414.

readonly
>   specifies that the volume is mounted write-protected.

Caution: ACSLS does not provide readonly protection for cartridges mounted in transports attached to a SCSI–attached LSM. That is, even if you specify the readonly option on a mount command, the transport can still write to the cartridge. To write protect cartridges for these transports, you must use the cartridge's readonly protection (such as a thumbwheel).

Usage Use the mount command to mount a data volume. You can only mount one volume on one transport each time you enter a mount command.

A successful mount requires the following:

* The volume and transport must be in the same ACS.

* The volume must be available and the transport must be online and available.

---

mount bypass   The bypass option overrides the checks that ACSLS does before trying to mount a volume as follows:.

- The bypass option always overrides the ACSLS verification of the volume ID on the external label.

- The bypass option overrides the ACSLS verification of compatibility between the transport type and volume media. Use this option *only* when you know that the transport and volume media are, in fact, compatible. For example, you could use the bypass option to force a mount of a DD3C volume on an SD3 (Redwood) transport if the volume's external label is missing the 7th (media type) character .

STOP

Warning: Do not use the bypass option unless you know that the media type of the specified volume is compatible with the transport. Otherwise you can damage the volume, the transport, or both.

Examples   To mount volume EDU010 on transport 0,0,10,2:

```
mount EDU010 0,0,10,2
```

In the following example, YUMA15 is a DD3C volume whose volume label is missing the seventh character. The bypass option bypasses the media compatibility checks and forces a mount of the volume on transport 0,0,4,0, an SD3 transport.

To mount YUMA15 on transport 0,0,4,0 using the bypass option:

```
mount YUMA15 0,0,4,0 bypass
```

Notes   None.

See Also

For information about...	See...
Dismounting a volume from a transport	<u>dis</u>mount command on page 389
Making a CAP (manual mode) ready to enter labelled cartridges into the library	<u>en</u>ter command on page 400
Making a CAP ready to enter unlabeled cartridges into the library	<u>ve</u>nter command on page 507
Displaying CAP status	<u>q</u>uery <u>cap</u> command on page 433
Displaying transport status	<u>q</u>uery <u>dr</u>ive command on page 438
Displaying the status of media–compatible transports for a specified data volume	<u>q</u>uery <u>mou</u>nt command on page 449
Displaying the location and media type of a volume	<u>q</u>uery <u>vo</u>lume command on page 467
Displaying the lock status of a transport or volume	<u>q</u>uery <u>loc</u>k command on page 444
Setting CAP selection priority	<u>set</u> <u>cap</u> <u>prio</u>rity command on page 474
Setting CAP mode (manual or automatic)	<u>set</u> <u>cap</u> <u>mod</u>e command on page 471

**Command Area
Messages**

Success Messages

Mount: *vol_id* mounted on *drive_id*

> **Explanation:** ACSLS mounted the specified volume.
>
> **Variable:**
>
> - *vol_id* is the volume identifier of the volume that ACSLS mounted.
>
> - *drive_id* is the transport that mounted the volume.

Intermediate
Messages

None.

Error Messages

Mount: Mount failed, Audit in progress.

> **Explanation:** ACSLS cannot mount the volume because an audit has locked out access to the cell location of the specified volume.

Mount: Mount failed, In use.

> **Explanation:** ACSLS cannot mount the volume because either the transport is in use or the requested volume is reserved for another command.

Mount: Mount failed, Misplaced tape.

> **Explanation:** ACSLS cannot mount the volume because the external label of the volume does not match the database's volume identifier for the storage cell. The database updates the volume identifier, media type, and cleaning cartridge attribute for the volume in the storage cell.

Mount: Mount failed, Not in same ACS.

> **Explanation:** ACSLS cannot mount the volume because the specified volume and transport are not in the same ACS.

Mount: Mount failed, Volume in drive.

> **Explanation:** ACSLS cannot mount the volume because the specified volume is already mounted in a transport.

Mount: Mount failed, Unreadable label.

> **Explanation:** ACSLS cannot mount the volume because the volume has no label, an unreadable label, or no virtual label.

Mount: Mount failed, Invalid media type.

> **Explanation:** ACSLS cannot mount the volume because the specified volume's media type is invalid.

Mount: Mount failed, Invalid drive type.

> **Explanation:** ACSLS cannot mount the volume because the specified transport's type is invalid.

Mount: Mount failed, Incompatible media type.

> **Explanation:** ACSLS cannot mount the volume because the volume's media type is incompatible with the specified transport.

Display Area Messages   None.

mount *

The <u>mou</u>nt <u>*</u> command mounts a scratch volume.

Format

<u>mou</u>nt * *drive_id* [*pool_id*] [<u>me</u>dia *media_type* | <u>me</u>dia *]

Options

drive_id
> specifies the transport.

pool_id
> specifies the pool from which ACSLS selects the scratch volume. *pool_id* is optional; if you do not specify a *pool_id* ACSLS tries to find a scratch volume in the common pool (Pool 0).
>
> If you specify a *pool_id* and the pool does not contain a scratch volume (or one of the correct media for mixed–media libraries) if the pool is set for overflow; ACSLS tries to find a scratch volume in the common pool (Pool 0).

<u>me</u>dia *media_type* | <u>me</u>dia *
> specifies the volume media type. Specifying the media type is optional; see "Usage" for more information.

Usage   Use the <u>mou</u>nt <u>*</u> command to mount a scratch volume. The
following sections describe how to specify the volume media
type for a scratch mount and the order in which ACSLS selects
scratch volumes within a pool.

Specifying Volume   As the single-media library examples in "Examples" show, you
Media Type   do not need to specify the media type for single-media libraries.
These libraries typically have only a single transport type and
heterogeneous scratch pools that contain volumes of a single
media type compatible with the transport type.

As the mixed-media library examples in "Examples" show, in
mixed-media libraries with *homogeneous scratch pools*
(mixed-media), however, you should specify a media type to
avoid transport/media incompatibilities. You can specify
volume media type in either of the following ways:

- Explicitly specify the media type in this form of the <u>mou</u>nt
<u>*</u> command:

  <u>mou</u>nt <u>*</u> *drive_id* [*pool_id*] <u>me</u>dia *media_type*

- Use a wildcard (*) for the media type so that ACSLS
selects the media by scratch preferences; for more
information see "Setting Scratch Preferences" on page 212.
To use scratch preferences, enter this form of the <u>mou</u>nt <u>*</u>
command:

  <u>mou</u>nt <u>*</u> *drive_id* [*pool_id*] <u>me</u>dia *

Caution: ACSLS will select a scratch volume regardless of
media type for any of the following conditions:

  ○ You do not specify a media type

  ○ You specify a wildcard (*) for the media type and the
     scratch_preferences.dat file is corrupted or does
     not exist

  ○ You specify a wildcard (*) for the media type and the
     scratch_preferences.dat file does not contain the
     drive you specify

How ACSLS
Selects Scratch
Volumes

The <u>mou</u>nt <u>*</u> command creates a list of valid scratch volumes
and then mounts the least recently accessed volume from that
list.

➡️ **For example, to mount a scratch volume from pool 5,
do the following:**

1. To display the status of the scratch volumes in pool 5,
   enter the following command:

   query scratch 5

   Pool 5 contains scratch volumes RB1400 through RB1406.
   These volumes are displayed by the least recently
   accessed; for this example, assume that volume RB1402 is
   the least recently accessed volume in pool 5. It is displayed
   at the top of the volume list.

2. To mount a scratch volume from pool 5 on transport
   0,0,10,2, enter the following command.

   mount * 0,0,10,2 5

   ACSLS mounts volume RB1402, which is the least
   recently accessed volume in pool 5.

Examples

The following sections show mount scratch examples for
single-media and mixed-media libraries.

Single–Media
Libraries

To mount a scratch volume from pool 5 on transport 0,0,10,2:

mount * 0,0,10,2 5

Hint: If no volume is available from pool 5 and it has
been set for <u>ove</u>rflow ACSLS will select a volume from
the common pool (pool 0).

To mount a scratch volume from the common pool (Pool 0) on
transport 0,0,10,0

mount * 0,0,10,0

Mixed–Media
Libraries

To mount a scratch volume from pool 5 with a media type of
3480 on transport 0,0,10,2:

mount * 0,0,10,2 5 media 3480

Hint: If no volume is available from pool 5 and it has
been set for <u>ov</u>erflow ACSLS will select a volume with
the specified media type from the common pool (pool 0).

To mount a scratch volume from pool 10 with media type
determined by scratch preferences on transport 0,0,2,3:

mount * 0,0,2,3 10 media *

Hint: If no volume is available from pool 10 and it has
been set for <u>ov</u>erflow ACSLS will select a volume with
the specified media type from the common pool (pool 0).

To mount a scratch volume from the common pool (pool 0) with
media type of 3480 on transport 0,0,10,2:

mount * 0,0,10,2 media 3480

To mount a scratch volume from the common pool (pool 0) with
media type determined by scratch preferences on transport
0,0,2,3:

mount * 0,0,2,3 media *

Notes   None.

See Also

For information about...	See...
Managing scratch volumes	"Managing Scratch Volumes" on page NO TAG
Setting scratch preferences	"Setting Scratch Preference" on page 212
Dismounting a volume from a transport	dismount command on page 389
Displaying transport status	query drive command on page 438
Displaying the status of media–compatible transports for a specified scratch pool	query mount * command on page 452
Displaying scratch volume status	query scratch command on page 462
Displaying scratch pool attributes	query pool command on page 455
Displaying the location and media type of a volume	query volume command on page 467
Displaying the lock status of a transport or volume	query lock command on page 444
Creating or modifying scratch pools	define pool command on page 383
Deleting empty scratch pools	delete pool command on page 386
Setting or clearing volume scratch attributes	set scratch command on page 483

Command Area
   Messages

Mount: *vol_id* mounted on *drive_id*

> **Explanation:** ACSLS mounted the specified volume.
>
> **Variable:**
>
> - *vol_id* is the volume identifier of the volume that ACSLS mounted.
>
> - *drive_id* is the transport that mounted the volume.

Intermediate   None.
   Messages

Error Messages

Mount: Mount failed, Audit in progress.

> **Explanation:** ACSLS cannot mount the volume because an audit has locked out access to the cell location of the specified volume.

Mount: Mount failed, In use.

> **Explanation:** ACSLS cannot mount the volume because either the transport is in use or the requested volume is reserved for another command.

Mount: Mount failed, Misplaced tape.

> **Explanation:** ACSLS cannot mount the volume because the external label of the volume does not match the database's volume identifier for the storage cell. The database updates the volume identifier, media type, and cleaning cartridge attribute for the volume in the storage cell.

Mount: Mount failed, Not in same ACS.

> **Explanation:** ACSLS cannot mount the volume because the specified volume and transport are not in the same ACS.

Mount: Mount failed, Volume in drive.

> **Explanation:** ACSLS cannot mount the volume because the specified volume is already mounted in a transport.

Mount: Mount failed, Unreadable label.

> **Explanation:** ACSLS cannot mount the volume because the volume has no label, an unreadable label, or no virtual label.

Mount: Mount failed, Invalid media type.

> **Explanation:** ACSLS cannot mount the volume because the specified volume's media type is invalid.

Mount: Mount failed, Invalid drive type.

> **Explanation:** ACSLS cannot mount the volume because the specified transport's type is invalid.

Mount: Mount failed, Incompatible media type.

> **Explanation:** ACSLS cannot mount the volume because the volume's media type is incompatible with the specified transport.

Mount: Mount failed, No compatible scratch volumes in pool.

> **Explanation:** ACSLS cannot mount the volume because because there are no scratch volumes in the ACS of the specified transport that match the scratch volume's media type. In addition, if the overflow attribute is set for the pool, there are no scratch volumes with valid media types.

Display Area
 Messages

Pool *pool_id*: low water mark warning.

> **Explanation:** The number of volumes in the specified scratch pool is less than or equal to the low volume threshold.
>
> **Variable:** *low_water_mark* is the low threshold of the specified scratch pool.

Pool *pool_id*: high water mark warning.

> **Explanation:** The number of volumes in the specified scratch pool is greater than or equal to the high volume threshold.
>
> **Variable:** *high_water_mark* is the high water volume threshold of the specified scratch pool.

move

The <u>mov</u>e command moves a specified volume to an available storage cell in a specified LSM.

Format

<u>mov</u>e *vol_id lsm_id*

Options

vol_id
   specifies the volume.

lsm_id
   specifies the LSM that will contain the moved volume.

Usage   Use the <u>mov</u>e command to move a specified volume to an available storage cell in either:

- A different panel in the same LSM. For example, if you want to empty an entire panel in an LSM, you can move all the volumes in that panel to a different locations in the same LSM.

- A different LSM.

You can move only one volume each time you enter the <u>mov</u>e command. If you specify the LSM where the volume currently resides, ACSLS will move the volume to another panel within that LSM. Otherwise, ACSLS will move it to the LSM you specify. You cannot cancel a <u>mov</u>e command.

A successful move requires the following:

- The volume must be available and in the same ACS as the specified LSM.

- The LSM where the volume currently resides and the specified LSM must both be online. The specified LSM must have at least one available storage cell. If the move is within the same LSM, there must be at least one available cell in a different panel in that LSM. If the move requires a passthru, any LSMs used must also be online.

Examples   To move volume EDU010 (which resides in LSM 0,1) to a different panel in this LSM:

> **move EDU010 0,1**

To move volume EDU010 (which resides in LSM 0,1) to LSM 0,2:

> **move EDU010 0,2**

Notes   None.

See Also

For information about...	See...
Displaying the location and media type of a volume	query volume command on page 467
Displaying the lock status of a transport or volume	query lock command on page 444
Displaying the status of an LSM	query lsm command on page 447

**Command Area
Messages**

Success Messages

```
Move: vol_id moved to location cell_id
```

> **Explanation:** ACSLS moved the specified volume to the
> specified cell location.
>
> **Variable:**
>
> - *vol_id* is the volume identifier of the volume that ACSLS
>   moved.
>
> - *cell_id* is the new cell location of the specified volume.

Intermediate   None.
Messages

Error Messages

```
Move: Move failed,
```

> **Explanation:**
>
> **Variable:**

Display Area   None.
Messages

---

query commands

The query commands display the status of a library component.
See the following sections for more information about each
query command, including format, options, and usage.

Format   The following shows the general format of the query
commands:

query *type* [*subtype* | *] *identifier*... | all

Notes   If a cancel request is issued against a pending or current query
request, the display of information is halted.

See Also

For information about...	See...
Cancelling a command	cancel command on page 375
Display Command	Chapter 15, *Display Command*

**Command Area
Messages**

Success Messages   None. If the query succeeds, the requested status appears.

Intermediate   None.
Messages

Error Messages

Library not available.

Explanation: The query failed because ACSLS is recovering
(all queries *except* query server).

`Volume identifier` *`vol_id`* `not found.`

> **Explanation:** The q̲u̲e̲ry m̲o̲u̲nt command cannot display status for the specified volume because it is not in the library.
>
> **Variable:** *vol_id* is the specified volume.

`Invalid media type`

> **Explanation:** The q̲u̲e̲ry m̲o̲u̲nt * command cannot display status for the specified volume because it either has an invalid media type or you specified an invalid media type on the command.
>
> **Variable:** *vol_id* is the specified volume.

Display Area Messages   None.

query acs

The query acs command displays ACS status.

Format

query acs *acs_id*... | all

Options

acs_id | all
> specifies the ACS to query or all for all ACSs.

Usage   Use the query acs command to display the status of an ACS in the following format:

```
yyyy-mm-dd      hh:mm:ss           ACS Status
Identifier   State  Free Cell   Audit  Mount  Dismount  Enter  Eject
                    Count       C/P    C/P    C/P       C/P    C/P

acs_id       state  count       n/n    n/n    n/n       n/n    n/n
```

Where:

acs_id
> is the ACS identifier.

state is one of the following ACS states:

> diagnostic
> > The ACS will process only current and pending requests and will reject any new requests. The ACS is unavailable to client applications and can only be controlled via cmd_proc. Use the vary command to vary the ACS online.

offline
> The ACS is offline.

<u>of</u>fline pending
> The ACS will process current and pending requests, then go offline. The ACS will reject any new requests.

<u>on</u>line
> The ACS is online.

recovery
> The ACS is initializing or recovering from errors. Wait for the ACS to go online.

count
> is the number of free cells in the ACS.

n   is the number of current (C) and pending (P) requests for the ACS for each command that requires library resources (<u>au</u>dit, <u>mou</u>nt, <u>dis</u>mount, <u>en</u>ter, and <u>ej</u>ect).

Examples   To query ACS 1:

query acs 1

To query all ACSs in the library:

query acs all

See Also

For information about...	See...
Changing the state of a library component	<u>va</u>ry command on page 498
Displaying request status	<u>q</u>uery <u>req</u>uest command on page 460

query cap

The query cap command displays CAP status.

Format

query cap *cap_id...* | <u>al</u>l

Options

cap_id | <u>al</u>l
    specifies the CAP to query or <u>al</u>l for all CAPs.

Note: You cannot specify a *cap_id* that contains asterisks.

Usage   Use the query cap command to display the status of a CAP.

The query cap command displays CAP status in the following format:

```
  yyyy-mm-dd    hh:mm:ss          CAP Status
  Identifier   Priority       Size        State      Mode      Status

  cap_id       cap_priority  cap_size                cap_mode  status
```

Where:

cap_id
    is the CAP identifier.

cap_priority
    is the CAP priority.

cap_size
    is the number of cells in the CAP.

---

cap_state
> is one of the following CAP states:

online
> The CAP is online.

offline
> The CAP is offline.

offline-pending
> The CAP will process current and pending requests, then go offline. The CAP will reject any new requests.

diagnostic
> The CAP will process only current and pending requests and will reject any new requests. The CAP is unavailable to client applications and can only be controlled via cmd_proc. Use the vary command to vary the CAP online.

recovery
> The CAP is initializing or recovering from errors. Wait for the CAP to go online.

cap_mode
> is one of the following CAP entry modes:

manual
> You must unlock the CAP before entering cartridges.

automatic
> The CAP is ready for cartridge entry.

status
> is one of the following CAP statuses:

available
> The CAP is available.

enter
> The CAP is unavailable (reserved for entering cartridges).

eject
> The CAP is unavailable (reserved for ejecting
> volumes).

audit
> The CAP is unavailable (reserved for audit
> processing).

Examples   To query CAP 0,1,0:

`query cap 0,1,0`

To query all CAPs in the library:

`query cap all`

See Also

For information about...	See...
Changing the state of a library component	vary command on page 498
Setting CAP selection priority	set cap priority command on page 474
Setting CAP mode (manual or automatic)	set cap mode command on page 471
Displaying request status	query request command on page 460

query clean

The query <u>clean</u> command displays cleaning cartridge status. Absent or ejected volumes are not displayed.

Format

query <u>clean</u> *vol_id*... | <u>al</u>l

Options

vol_id | <u>al</u>l
   specifies the cleaning cartridge to query or <u>al</u>l for all cartridges.

Usage

Use the query <u>clean</u> command to display the status of a cleaning cartridge in the following format:

```
yyyy-mm-dd     hh:mm:ss Cleaning Cartridge Status
Identifier  Home Location  Max Usage  Current Use Status   Type
vol_id      cell_id        max_usage  current_use status   type
```

Where:

vol_id
   is the volume identifier of the cleaning cartridge.

cell_id
   is the location of the cleaning cartridge.

max_usage
   is the number of times the cleaning cartridge can be used.

current_usage
> is the number of times the cleaning cartridge has been used.

status
> is the location of the cleaning cartridge:

home
> The cartridge is in a storage cell.

in drive
> The cartridge is in a transport.

in transit
> The cartridge is being moved.

type is the cartridge media type (for example, 3480, DD3D, DLTIII, or STK1R).

Examples   To display status information for cleaning cartridge J35992:

> **query clean J35992**

To query all cleaning cartridges:

> **query clean all**

See Also

For information about...	See...
Guidelines and procedures for cleaning transports	"Cleaning Transports" on page 271
Setting cleaning cartridge attributes	<u>set</u> <u>clean</u> command on page 477

query drive

The query drive command displays transport status.

Format

query drive *drive_id*... | all

Options

drive_id | all
     specifies the transport to query or all for all transports.

Usage   Use the query drive command to display the status of a
              transport in the following format:

```
 yyyy-mm-dd      hh:mm:ss              Drive Status
 Identifier      State           Status          Volume         Type

 drive_id        state           status          vol_id         type
```

Where:

drive_id
     is the transport identifier.

The *state* is one of the following transport states:

     online
          The transport is online.

     offline
          The transport is offline.

diagnostic

> The transport will process only current and pending requests and will reject any new requests. The transport is unavailable to client applications and can only be controlled via cmd_proc. Use the vary command to vary the transport online.

recovery

> The transport is initializing or recovering from errors. Wait for the transport to go online.

status

> is one of the following transport statuses:

In use

> The transport has a volume mounted or is reserved for a mount.

Available

> The transport is available for a mount.

vol_id

> is the identifier of the volume in the transport.   This field is blank if there is no volume in the transport or if the volume's external label is unreadable or unknown.

drive_type

> is the transport type.

Examples   To query transport 0,3,1,0:

> **query drive 0,3,1,0**

To query all transports:

> **query drive all**

See Also

For information about...	See...
Changing the state of a library component	<u>va</u>ry command on page 498
Dismounting a volume from a transport	<u>dis</u>mount command on page 389
Drive serial numbers	Chapter 15, *Display Command*, `display drive`

query lmu

The query lmu command displays LMU and port status for both single-LMU and dual-LMU ACS configurations.

Note: ACSLS supports dual-LMU configurations for *only* the 9330 LMU with host/LMU microcode compatibility Level 12. The same microcode level must be loaded in both LMUs.

Format

query lmu *acs_id*... | all

Options

acs_id | all
> specifies the ACS whose LMUs you want to query or all to query LMUs for all ACSs.

Usage   Use the query lmu command to display LMU and port status for both single-LMU and dual-LMU ACS configurations in the following format:

```
                         LMU Status
   ACS:    acsid         Mode:    mode         Master Status:    status
                                  Standby Status:    status

   Port       Port Name    Port State    Role         Compat Level
   port_id    dev_name     state         role(des)    compat_level
```

Where:

acs_id
    is the ACS identifier.

mode
    is the LMU mode (`Dual LMU`, `Single LMU`, or `SCSI LMU`).

status
    is the master or standby LMU status (`Communicating`, `Communicating`, or `Offline`). SCSI LMUs show — for status.

port_id
    is the port identifier.

dev_name
    is the port device name.

state
    is one of the following port states:

    <u>on</u>line
        The port is online.

    <u>of</u>fline
        The port is offline.

role (*des*)
>   is the LMU's role and designation (A or B) where roles
>   are:

> Master
>>   LMU is in master role (the LMU is managing the
>>   ACS).

> Standby
>>   LMU is in standby role (not managing the ACS,
>>   communicating with the master LMU and available
>>   for switchover).

> **Note:** During switchover, the *role* field information is not
> current, and may display as a single dash (-). As the
> information becomes current, ACSLS refreshes the *role*
> field with the actual role of each LMU.

compat_level
>   is the host/LMU microcode compatibility level. Level 11
>   or above is required for dual–LMU configurations.

Examples   To display LMU and port status for all LMUs managing all
ACSs:

>   **query lmu all**

To display LMU and port status for all LMUs managing ACSs 0
and 1:

>   **query lmu 0 1**

See Also

For information about...	See...
Manually switching ACS management from the ACS's master LMU to the standby LMU	<u>sw</u>itch <u>l</u>mu command on page 490

query lock

The query lock command displays the lock status of a
transport or volume.

Format

query lock *type identifier*... | <u>al</u>l

Options

type identifier | <u>al</u>l
>   specifies the transport or volume to query or <u>al</u>l for all
>   transports or volumes as shown in Table 28.

Table 28.   Valid Lock Types for query lock

Library Component	*type*	*identifier*
transport	<u>dr</u>ive	*drive_id*
volume	<u>vo</u>lume	*vol_id*

Usage   Use the query lock command to display the lock status of a
transport or volume in the following format:

```
yyyy-mm-dd      hh:mm:ss           Lock Status
Identifier   Lock-id   Duration    Pending    Status   User Identifier

vol_id       lock_id   duration    pending    status   user_id
or
drive_id     lock_id   duration    pending    status   user_id
```

Where:

vol_id
>   is the identifier of the specified volume.

---

drive_id
> is the identifier of the specified transport.

lock_id
> is the lock ID.

duration
> is the amount of time, in seconds, that the lock has been active.

pending
> is the number of lock requests that are waiting for volume or transport.

status is one of the following statuses:

available
> The volume or transport is available.

in use
> The volume or transport is in use or is reserved for a mount.

user_id is the user ID that has locked the volume or transport. The *user_id* wraps after 80 characters.

Examples   To display lock status information for transport 1,0,4,0:

```
q loc dr 1,0,4,0
```

To display lock status information for all transports:

```
query lock drive all
```

To display lock status information for volume SL4493:

```
query lock volume SL4493
```

To display lock status information for all volumes:

```
query lock volume all
```

See Also

For information about...	See...
Removing all active or pending locks on a specified transport or volume	clear lock command on page 380
Locking transports and volumes	lock command on page 408
Setting your lock ID	set lock command on page 480
Displaying your lock or user ID	show command on page 486
Removing active locks	unlock command on page 495

query lsm

The query lsm command displays LSM status.

Format

query lsm *lsm_id*... | all

Options

lsm_id | all
>   specifies the LSM to query or all for all locks.

Usage Use the query lsm command to display the status of an LSM in the following format:

```
yyyy-mm-dd    hh:mm:ss         LSM Status
Identifier  State  Free Cell   Audit  Mount  Dismount  Enter  Eject
                   Count       C/P    C/P    C/P       C/P    C/P

lsm_id      state  count       n/n    n/n    n/n       n/n    n/n
```

Where:

lsm_id
>   is the LSM identifier.

state is one of the following LSM states:

diagnostic
>   The LSM will process only current and pending requests and will reject any new requests. The LSM is unavailable to client applications and can only be controlled via cmd_proc. Use the vary command to vary the LSM online.

offline
>   The LSM is offline.

offline pending
>   The LSM will process current and pending requests,
>   then go offline. The LSM will reject any new
>   requests.

online
>   The LSM is online.

recovery
>   The LSM is initializing or recovering from errors.
>   Wait for the LSM to go online.

count
>   is the number of free storage cells in the LSM.

n   is the number of current (C) and pending (P) requests for
>   the LSM for each command that requires library resources
>   (audit, mount, dismount, enter, and eject).

Examples   To display status information for LSM 1 of ACS 0:

query lsm 0,1

To display status information for all LSMs:

query lsm all

See Also

For information about...	See...
Changing the state of a library component	vary command on page 498
Displaying request status	query request command on page 460

query mount

The query mount command displays the status of media–compatible transports for a specified data volume. These transports are not displayed if a volume(s) is absent or rejected.

Format

query mount *vol_id*

Options

vol_id specifies the volume to query.

Usage Use the query mount command to display the status of all library transports attached to the same ACS as the volume and compatible with the media type of the specified volume. query mount displays transport status for LSMs in any state (online, offline, offline-pending, or diagnostic).

The compatible transports are ordered by proximity to the specified volume in the following format:

```
yyyy-mm-dd      hh:mm:ss              Mount Status
Identifier Status    Drive      State  Status      Volume Drive Type
vol_id     vol_stat  drive_id   state  drive_stat  inu_id drive_type
```

Where:

vol_id
      is the identifier of the specified volume.

vol_stat
      is the location of the volume:

`home`
> The volume is in a storage cell.

`in drive`
> The volume is in a transport.

`in transit`
> The volume is being moved or is missing.

drive_id
> is a list of all library transports compatible with the media type of the specified volume.

drive_id
> is the transport identifier.

state
> is one of the following transport states:

`online`
> The transport is online.

`offline`
> The transport is offline.

`diagnostic`
> The transport will process only current and pending requests and will reject any new requests. The transport is unavailable to client applications and can only be controlled via `cmd_proc`. Use the `vary` command to vary the transport online.

`recovery`
> The transport is initializing or recovering from errors. Wait for the transport to go online.

status
> is one of the following transport statuses:

`In use`
> The transport has a volume mounted or is reserved for a mount.

`Available`
> The transport is available for a mount.

inu_id is the identifier of the volume in the transport. The
volume id appears only if the *drive_stat* is In use.

drive_type
is the transport type.

Examples To display status information of transports ordered by proximity
to volume ZUNI14:

```
query mount ZUNI14
```

See Also

For information about...	See...
Mounting a data volume on a transport	<u>mou</u>nt command on page 413
Changing the state of a library component	<u>va</u>ry command on page 498
Displaying the location and media type of a volume	<u>q</u>uery <u>vol</u>ume command on page 467
Displaying the lock status of a transport or volume	<u>q</u>uery <u>loc</u>k command on page 444

query mount *

The query mount * command displays the status of media-compatible transports for a specified scratch pool (and, optionally, for a specific volume media type within the pool).

Format

query mount * *pool_id*... [media *media_type* | media *]

Options

pool_id
    specifies the scratch pool to query.

media *media_type* | media *
    specifies the media type.

Usage   Use the query mount * command to display the status of all library transports compatible with all volume media types in a specified scratch pool and in the same ACS as the volumes. Pool 0 is the common scratch pool. Specify the *media_type* option to restrict the display to transports compatible with a specific volume media type within the pool. The displayed transports are ordered by proximity to the densest scratch pools. query mount * displays transport status for LSMs in any state (online, offline, offline-pending, or diagnostic).

The query mount * command displays transport status in the following format:

```
yyyy-mm-dd     hh:mm:ss        Mount Scratch Status
Identifier Drive      State    Volume    Status         Drive Type

pool_id    drive_id   state    vol_id    drive_stat     drive_type
```

Where:

pool_id
    is the specified scratch pool.

drive_id
    is a list of all library transports compatible with all media
    types of the specified pool (or a specific media type within
    the pool if a media type was specified).

state
    is one of the following transport states:

    <u>on</u>line
        The transport is online.

    <u>of</u>fline
        The transport is offline.

    <u>dia</u>gnostic
        The transport will process only current and pending
        requests and will reject any new requests. The
        transport is unavailable to client applications and can
        only be controlled via cmd_proc. Use the <u>va</u>ry
        command to vary the transport online.

    recovery
        The transport is initializing or recovering from errors.
        Wait for the transport to go online.

vol_id
    is the identifier of the volume in the transport. The volume
    id appears only if the *drive_stat* is In use.

drive_stat
    is one of the following transport statuses:

    In use
        The transport has a volume mounted or is reserved
        for a mount.

    Available
        The transport is available for a mount.

drive_type
        is the transport type.

Examples   To display status of compatible transports listed by proximity to the largest concentration of scratch tapes in pool 5:

        `query mount * 5`

To display status of compatible transports listed by proximity to the largest concentration of 3480 scratch tapes in common pool 0:

        `query mount * 0 media 3480`

See Also

For information about...	See...
Mounting a scratch volume on a transport	mount * command on page 418
Changing the state of a library component	vary command on page 498
Displaying scratch pool attributes	query pool command on page 455
Creating or modifying scratch pools	define pool command on page 383
Deleting empty scratch pools	delete pool command on page 386
Displaying scratch volume status	query scratch command on page 462
Setting or clearing volume scratch attributes	set scratch command on page 483
Displaying the lock status of a transport or volume	query lock command on page 444

query pool

The query pool command displays scratch pool attributes.

Format

query pool *pool_id...* | all

Options

pool_id | all
> specifies the scratch pool to query or all for all pools.
> Pool 0 is the common pool.

Usage

Use the query pool command to display scratch pool attributes in the following format:

```
yyyy-mm-dd    hh:mm:ss            Pool Status
 Identifier Volume Count  Low Water Mark  High Water Mark  Attributes

 pool_id     vol_count     low_water_mark  high_water_mark  attribute
```

Where:

pool_id
> is the specified scratch pool.

vol_count
> is the number of scratch volumes in the pool.
>
> Absent and ejected scratch volumes are not counted.

low_water_mark

is the low volume warning threshold. If the scratch volume count falls below this threshold, ACSLS logs a warning message in the event log. A "–" after the value means that the scratch volume count is below the low volume threshold .

high_water_mark

is the high volume warning threshold. If the scratch volume count reaches or exceeds this threshold, ACSLS logs a warning message in the event log. A "+" after the value means that the scratch volume count is at or above the high volume threshold .

attribute

is displayed if `overflow` is set (via the `set scratch` command) for the specified scratch pool. `overflow` specifies that scratch volumes are selected from the common scratch pool (Pool 0) if `mount scratch *` requests cannot be satisfied with a volume from the specified scratch pool.

Examples

To display status information for scratch pool 5:

query pool 5

To display status information for all scratch pools:

query pool all

See Also

For information about...	See...
Creating or modifying scratch pools	define pool command on page 383
Deleting empty scratch pools	delete pool command on page 386
Displaying scratch volume status	query scratch command on page 462
Setting or clearing volume scratch attributes	set scratch command on page 483

query port

The query port command displays port status.

Format

query port *port_id*... | all

Options

port_id | all
    specifies the port to query or all for all ports.

Usage

Use the query port command to display the status of a port in the following format:

---

yyyy-mm-dd   *hh:mm:ss*   Port Status
State   Identifier

state   *port_id*

Where:

state
    is one of the following port states:

    online
        The port is online.

    offline
        The port is offline.

port_id
    is the port identifier.

Examples   To display status information for port 0,0:

> `query port 0,0`

To query all ports:

> `query port all`

See Also

For information about...	See...
Changing the state of a library component	<u>va</u>ry command on page 498

query request

The query request command displays request status.

Format

query request *request_id*... | al̲l̲

Options

request_id | al̲l̲
    specifies the request to query or al̲l̲ for all requests.

Usage

Use the query request command to display the status of a request in the following format:

```
yyyy-mm-dd    hh:mm:ss          Request Status
Identifier                  Command                     Status

request_id                  command                     status
```

Where:

 request_id
    is the ACSLS request identifier.

command
    is theACSLS command that corresponds to the request identifier.

status
>   is one of the following request statuses:

>   Current
>   >   ACSLS is processing the request.

>   Pending
>   >   The request is waiting to be processed.

Not found
>   The specified request is not a valid ACSLS request.

Examples   To display status information for request 33179:

>   **query request 33179**

To display all current and pending requests:

>   **query request all**

See Also

For information about...	See...
Cancelling a command	cancel command on page 375

query scratch

The query scratch command displays the status of scratch volumes in a pool sorted by ascending order of access date. The volumes with the earliest access date are at the top of the list with the most recently used volumes at the bottom of the list. Pool IDs in the first column do not appear in any particular order. Only those volumes permitted through Access Control are displayed.

Format

query scratch *pool_id*... | all

Options

pool_id | all
specifies the scratch pool to query or all for all pools. Pool 0 is the common pool.

Usage

Use the query scratch command to display the status of scratch volumes in a pool in the following format:

```
yyyy-mm-dd      hh:mm:ss            Scratch Status
Scratch Pool  Identifier     Home Location    Status      Type

pool_id       vol_id         cell_id          status      media_type
```

Where:

pool_id
is the specified scratch pool.

vol_id   is the identifier of the scratch volume.

cell_id
　　　is the storage cell that contains the volume.

status is the location of the volume:

　　home
　　　　The volume is in a storage cell.

　　in drive
　　　　The volume is in a transport.

　　in transit
　　　　The volume is being moved.

media_type
　　　is the volume's media type (for example, 3480, 3490E,
　　　DD3D, or DLTIV).

Note: Scratch volumes with a volume status of absent, ejected,
or missing are not included in the Query Scratch output.

Note: To see volumes sorted by pool, you issue successive
Query Scratch commands for each pool. Alternately, you can
issue the Display volume command to see the information and
sort it by pool, but you will not be guaranteed of getting the least
recently used scratch volume.

Examples　To display status information for scratch volumes in scratch pool
29015:

　　query scratch 29015

To display status information for scratch volumes in all scratch
pools:

　　query scratch all

See Also

For information about...	See...
Creating or modifying scratch pools	define pool command on page 383
Deleting empty scratch pools	delete pool command on page 386
Setting or clearing volume scratch attributes	set scratch command on page 483

query server

The query server command displays ACSLS and library status.

Format

    query server

Options   None.

Usage   Use the query server command to display the status of ACSLS and the library in the following format:

```
 yyyy-mm-dd    hh:mm:ss        Server Status
  Identifier   State  Free Cell  Audit  Mount  Dismount  Enter  Eject
                      Count      C/P    C/P    C/P       C/P    C/P

              state  count      n/n    n/n    n/n       n/n    n/n
```

Where:

Identifier   is blank

state is one of the following ACSLS states:

> idle
>> ACSLS is idle (not processing requests).

> idle pending
>> ACSLS will process current and pending request, reject new request, then go idle.

> recovery
>> ACSLS is initializing (going to run state) or recovering from errors; ACSLS is not processing requests.

run   ACSLS is running (processing requests).

count
is the number of free storage cells in the library.

n   is the number of current (C) and pending (P) ACSLS
requests for each command that requires library resources
(au̲dit, mo̲unt, di̲smount, en̲ter, and ej̲ect).

Hint: You cannot cancel a qu̲ery se̲rver request.

Examples   To display status information on the server:

query server

See Also

For information about...	See...
Changing the state of a library component	va̲ry command on page 498
Displaying request status	qu̲ery re̲quest command on page 460

query volume

The <u>q</u>uery <u>vo</u>lume command displays the location of a volume.

Format

query <u>vo</u>lume *vol_id*... | <u>al</u>l

Options

vol_id | <u>al</u>l
> specifies the volume to query or <u>al</u>l for all volumes.

Usage

Use the <u>q</u>uery <u>vo</u>lume command to display the location of a volume in the following format:

```
yyyy-mm-dd      hh:mm:ss           Volume Status
Identifier      Status          Current Location          Type

vol_id          status          location                  media_type
```

Where:

vol_id
> is the volume identifier .

status is the location of the volume:

> home
> > The volume is in a storage cell.
>
> in drive
> > The volume is in a transport.
>
> in transit
> > The volume is being moved or is missing.

> absent
>> The volume cannot be found.
>
> ejected
>> The volume has been ejected from the library.

location
> specifies the location as one of the following:

- If the status is home, the location is a storage cell identifier.

- If the status is in transit, the location is either a cell identifier or a transport identifier.

- If the status is in drive, the location is a transport identifier.

media_type
> is the volume's media type (for example, 3480, 3490E, DD3D, or DLTIV).

Examples   To display status information for volume 2903B:

> **query volume 2903B**

To display all volumes in the library:

> **query volume all**

See Also

For information about...	See...
Mounting a data volume on a transport	<u>mou</u>nt command on page 413
Displaying the status of media–compatible transports for a specified data volume	<u>q</u>uery <u>mou</u>nt command on page 449
Setting or clearing volume scratch attributes	<u>set</u> <u>scr</u>atch command on page 483
Changing the state of a library component	<u>va</u>ry command on page 498

For information about...	See...
Display Command	Chapter 15, *Display Command*, `display volume`
Displaying the lock status of a transport or volume	`query loc`k command on page 444
Displaying scratch pool attributes	`query poo`l command on page 455
Other volume information	Customized volume reports in Chapter 12, *Reporting and Logging*

set commands

The <u>set</u> commands set various attributes of different library components. See the following sections for more information about each <u>set</u> command, including format, options, usage, and messages.

Format   The following shows the general format of the <u>set</u> commands:

<u>set</u> *type* [<u>off</u> | *subtype*] [*] *identifier*...

See Also

For information about...	See...
Cancelling a command	<u>can</u>cel command on page 375

Command Area Messages

Success Messages   The following message appears when a set command succeeds:

Set: Set completed, Success.

See each <u>set</u> command for specific success messages.

Intermediate Messages   None.

Error Messages   See each <u>set</u> command for specific messages.

Display Area Messages   See each <u>set</u> command for specific messages.

set cap mode

The <u>set</u> <u>cap</u> <u>mod</u>e command sets a CAP's entry mode.

Format

<u>set</u> <u>cap</u> <u>mod</u>e *cap_mode cap_id*

Options

cap_mode
> specifies manual (`manual`) or automatic (`automatic`) CAP mode.

cap_id
> specifies the CAP identifier.
>
> You cannot specify a CAP identifier that contains an asterisk (*).

Usage

Use the <u>set</u> <u>cap</u> <u>mod</u>e command to set a CAP's entry mode to one of the following modes:

manual
> You must enter an <u>enter</u> command before entering cartridges.

automatic
> You can enter cartridges without first entering an <u>enter</u> command.

Hint: You cannot change a CAP's mode while the CAP is in use. That is, if the door is open during either manual or automatic enter operations, you cannot change its mode until you complete the enter operation.

Examples   To set CAP 0,3,1 in manual mode:

set cap mode manual 0,3,1

To set CAP 0,3,1 in automatic mode:

set cap mode automatic 0,3,1

See Also

For information about...	See...
Displaying CAP status	query cap command on page 433
Changing the state of a library component	vary command on page 498
Making a CAP (manual mode) ready to enter labelled cartridges into the library	enter command on page 400
Making a CAP ready to enter unlabeled cartridges into the library	venter command on page 507

Command Area Messages

Success Messages

Set: CAP *cap_id*, mode changed to *cap_mode*.

Explanation: ACSLS changed the mode of the specified CAP.

Variable:

- *cap_id* is the CAP whose mode is changed.

- *cap_mode* is the new enter mode of the CAP.

Intermediate   None.
Messages

Error Messages

```
Set: CAP cap_id Set failed, Incorrect attribute.
```

> **Explanation:** ACSLS cannot change the mode of the specified CAP because you specified an invalid CAP mode.
>
> **Variable:** *cap_id* is the CAP whose mode is not changed.

Display Area Messages

```
CAP cap_id: Automatic mode.
```

> **Explanation:** ACSLS changed the specified CAP's mode to automatic.
>
> **Variable:** *cap_id* is the CAP whose mode is changed.

```
CAP cap_id: Manual mode.
```

> **Explanation:** ACSLS changed the specified CAP's mode to manual.
>
> **Variable:** *cap_id* is the CAP whose mode is changed.

set cap priority

The <u>set</u> <u>cap</u> <u>pri</u>ority command sets a CAP's automatic selection priority.

Format

<u>set</u> <u>cap</u> <u>pri</u>ority *cap_priority cap_id*

Options

cap_priority
    specifies the CAP priority. Valid values are 0 to 16, where 16 is the highest priority. All CAPs initially have a 0 priority, which means that ACSLS does not automatically select the CAP.

cap_id
    specifies the CAP identifier. You must specify a particular CAP; you cannot specify an asterisk (*) to set the same priority for all CAPs.

Usage

Use the <u>set</u> <u>cap</u> <u>pri</u>ority command to set a CAP's automatic selection priority.

If a CAP request specifies an asterisk (*) for the CAP ID, ACSLS automatically selects an available CAP with highest non–zero priority for each ACS specified in the request.

Examples

To assign priority 16 to CAP 0,3,1:

set cap priority 16 0,3,1

See Also

For information about...	See...
Displaying CAP status	query cap command on page 433
Changing the state of a library component	vary command on page 498
Updating the ACSLS database to match the actual inventory of library volumes	audit command on page 367
Ejecting volumes from the library	eject command on page 394
Making a CAP (manual mode) ready to enter labelled cartridges into the library	enter command on page 400
Making a CAP ready to enter unlabeled cartridges into the library	venter command on page 507

Command Area Messages   updates the ACSLS database to match the actual inventory of library volumes.

Success Messages

```
Set: CAP cap_id, priority changed to cap_priority.
```

Explanation: ACSLS changed the priority of the specified CAP.

Variable:

- *cap_id* is the CAP whose priority is changed.

- *cap_priority* is the new CAP priority.

Intermediate   None.
Messages

Error Messages

```
Set: CAP cap_id Set failed, Incorrect attribute.
```

Explanation: ACSLS cannot change the mode of the specified CAP because you specified an invalid CAP priority.

Variable: *cap_id* is the CAP whose priority is not changed.

Display Area Messages None.

set clean

The <u>set</u> <u>clean</u> command sets cleaning cartridge attributes.

Format

<u>set</u> <u>clean</u> *max_usage* | <u>of</u>f *vol_id* | *volrange*

Options

max_usage|<u>of</u>f
> specifies the number of times a cleaning cartridge is used before ACSLS stops selecting the cartridge to clean transports. <u>of</u>f specifies that ACSLS will not select the cartridge and redefines the cartridge as a data volume.

vol_id|*volrange*
> specifies the cleaning cartridge or range of cartridges.

Usage
Use the <u>set</u> <u>clean</u> command to set the number of times ACSLS will select a cleaning cartridge. You also use <u>set</u> <u>clean</u> to set a cartridge's cleaning cartridge attribute off, which you do if you have incorrectly defined a data volume as a cleaning cartridge.

Examples
To set the maximum use to 10 for cleaning cartridges CLN108 – CLN112:

> `set clean 10 CLNI108-CLNI112`

To set the cleaning cartridge attribute off and redefine cartridges HRR234 – HRR244 as data volumes:

> `set clean off HRR234-HRR244`

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See Also

For information about...	See...
Guidelines and procedures for cleaning transports	"Cleaning Transports" on page 271
Displaying cleaning cartridge status	query <u>clean</u> command on page 436

**Command Area
Messages**

Success Messages

Set: volume *vol_id* is a cleaning cartridge.

> **Explanation:** ACSLS specified that the cleaning cartridge is valid for transport cleaning.

> **Variable:** *vol_id* is the valid cleaning cartridge.

Set: volume *vol_id* is not a cleaning cartridge.

> **Explanation:** ACSLS specified that the cleaning cartridge is not valid for transport cleaning.

> **Variable:** *vol_id* is the invalid cleaning cartridge.

Intermediate
Messages

None.

Error Messages

Set: Clean *vol_id* Set failed, Incorrect attribute.

> **Explanation:** ACSLS cannot change the cleaning attribute because the specified volume is not a cleaning cartridge.

> **Variable:** *vol_id* is the data or scratch volume.

**Display Area   None.
Messages**

set lock

The <u>set loc</u>k command sets your lock ID.

Format

<u>set loc</u>k *lock_id*

Options

lock_id
   specifies the lock ID. Valid lock IDs are 0 to 32767.

Usage

Use the <u>set loc</u>k command to set or change your lock ID. Change your current lock ID when you want to remove locks on a transport or volume whose lock ID does not match your current lock ID as follows:

- To clear all locks on a specified transport or volume, set your lock ID to 0, then enter a <u>clear loc</u>k command.

- To remove active locks on transports or volumes, set your lock ID to the lock ID of the locked components, then enter an <u>un</u>lock command.

Note: When you enter a <u>loc</u>k command to lock a volume or transport, ACSLS assigns a lock ID to the volume or transport and then changes your lock ID to the lock ID of the volume or transport. You cannot use the <u>set loc</u>k command to set your lock ID and then use the <u>loc</u>k command to lock a volume or transport with the lock ID that you set with <u>set loc</u>k**.**

Examples

To change your current lock ID lock to new lock ID 354:

set lock 3557

See Also

For information about...	See...
Removing all active or pending locks on a specified transport or volume	clear lock command on page 380
Locking transports and volumes	lock command on page 408
Displaying the lock status of a transport or volume	query lock command on page 444
Displaying your lock or user ID	show command on page 486
Removing active locks	unlock command on page 495

Command Area Messages

Success Messages

```
Set: Changed lock identifier from previous_lock_id to lock_id.
```

Explanation: ACSLS changed your lock ID.

Variable:

- *previous_lock_id* was your previous lock ID.
- *lock_id* is your new lock ID.

Intermediate Messages   None.

Error Messages   None.

Display Area Messages   None.

set owner

The <u>set</u> <u>owner</u> command sets volume ownership.

Format

<u>set</u> <u>owner</u> *owner_id* <u>vo</u>lume *vol_id* | *volrange*

Options

owner_id
    specifies the owner identifier. You must enclosed this
    value in quotes ("").

<u>vo</u>lume *vol_id* | *volrange*
    specifies the volume or range of volumes.

Usage   Use the <u>set</u> <u>owner</u> command to set volume ownership. You
must enter <u>set</u> <u>owner</u> from cmd_proc; you cannot set volume
ownership from a client application.

Examples   To assign ownership of volume YUMA06:

set owner "cray" volume YUMA06

Notes   None.

See Also

For information about...	See...
volume access control	"How Volume Access Control Works" on page 167.

Command Area Messages   None.

Display Area Messages   None.

set scratch

The <u>set</u> <u>sc</u>ratch command sets or clears a volume's scratch attribute and assigns the volume to a pool.

Format

<u>set</u> <u>sc</u>ratch [<u>of</u>f] *pool_id vol_id | volrange*

Options

<u>of</u>f specifies that the volume is a data volume.

pool_id
> specifies the volume's scratch pool. Specify an asterisk (*) to reassign a data volume to its current pool.

vol_id | volrange
> specifies the volume or range of volumes.

Usage Use the <u>set</u> <u>sc</u>ratch command to set or clear a volume's scratch attribute and assign the volume to a pool.

Examples To define volumes YUMA10–YUMA20 as scratch volumes and assign them to scratch pool 5:

        set scratch 5 YUMA10-YUMA20

To move scratch volumes YUMA10–YUMA15 to pool 10:

        set scratch 10 YUMA10-YUMA15

To "unscratch" (change from scratch to data) volumes YUMA16–YUMA20 and move them to the common pool (pool 0):

        set scratch off 0 YUMA16-YUMA20

To scratch to data volumes YUMA16–YUMA20 and keep them in their current pool:

        set scratch * YUMA16-YUMA20

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See Also

For information about...	See...
Displaying scratch volume status	query scratch command on page 462
Displaying scratch pool attributes	query pool command on page 455
Creating or modifying scratch pools	define pool command on page 383
Deleting empty scratch pools	delete pool command on page 386

Command Area Messages

Success Messages

Set: volume *vol_id* in tape pool *pool_id* is a scratch volume.

> **Explanation:** ACSLS changed the specified data volume to a scratch volume and assigned it to a pool.
>
> **Variable:**
>
> - *vol_id* is the specified volume.
>
> - *pool_id* is the pool to which the volume is assigned.

Set: volume *vol_id* in tape pool *pool_id* is a data volume.

> **Explanation:** ACSLS changed the specified scratch volume to a data volume.
>
> **Variable:** *vol_id* is the specified volume.

Intermediate Messages — None.

Error Messages

Set: Scratch *vol_id* Set failed, Incorrect attribute.

> **Explanation:** ACSLS cannot change the scratch attribute because the specified volume is a cleaning cartridge.
>
> **Variable:** *vol_id* is the cleaning cartridge.

Display Area Messages

Pool *pool_id*: low water mark warning.

> **Explanation:** The number of volumes in the specified scratch pool is less than or equal to the low threshold.
>
> **Variable:** *low_water_mark* is the low threshold of the specified scratch pool.

Pool *pool_id*: high water mark warning.

> **Explanation:** The number of volumes in the specified scratch pool is greater than or equal to the high threshold.
>
> **Variable:** *high_water_mark* is the high threshold of the specified scratch pool.

show

The <u>sh</u>ow command displays your lock ID or user ID.

Format

<u>sh</u>ow *type*

Options

type
    specifies one of the following types:

    <u>loc</u>k
        Your lock ID.

    <u>us</u>er
        Your user ID.

Usage   Use the <u>sh</u>ow command to display your lock ID or user ID.

Examples   To display requestor's user_id:

    show user

To display current lock_id:

    show lock

Notes   None.

See Also

For information about...	See...
Removing all active or pending locks on a specified transport or volume	clear lock command on page 380
Locking transports and volumes	lock command on page 408
Displaying the lock status of a transport or volume	query lock command on page 444
Setting your lock ID	set lock command on page 480
Removing active locks	unlock command on page 495

**Command Area
Messages**

Success Messages

Show: Current lock identifier is *lock_id*.

> **Explanation:** Your current lock ID is *lock_id*.

Show: User identifier is *user_id*.

> **Explanation:** Your current user ID is *user_id*.

Intermediate
Messages

None.

Error Messages   None.

**Display Area
Messages**

None.

start

The <u>st</u>art command starts ACSLS request processing.

Format

<u>st</u>art

Options   None.

Usage   Use the <u>st</u>art command to put ACSLS in run state and start ACSLS request processing. You typically use the <u>st</u>art command to restart request processing if ACSLS is idled.

Examples   To restart ACSLS request processing:

start

Notes   If ACSLS is in run state, entering the <u>st</u>art command has no effect.

See Also

For information about...	See...
Displaying the status of a library component	<u>q</u>uery commands on page 429
Stopping ACSLS from processing new requests	<u>idle</u> command on page 405
Changing the state of a library component	<u>va</u>ry command on page 498
Stopping ACSLS	"Stopping ACSLS" on page 7
Restarting ACSLS	"Starting ACSLS" on page 6

**Command Area
Messages**

Success Messages

ACSLM Request Processing Started: Success.

    Explanation: ACSLS started processing requests.

Intermediate   None.
Messages

Error Messages

ACSLM Request Processing Not Started: *status*

    Explanation: ACSLS did not start processing requests.

    Variable: *status* is the reason for the failure. For more
information on common status messages, see *ACSLS Messages*.

**Display Area
Messages**

Server system running

    Explanation: ACSLS started processing requests.

switch lmu

In dual–LMU configurations, the <u>sw</u>itch <u>l</u>mu command manually switches ACS management from the ACS's master LMU to the standby LMU.

Note: ACSLS supports dual-LMU configurations for *only* the 9330 LMU with host/LMU microcode compatibility Level 11 or above loaded. The same microcode level must be loaded in both LMUs.

Format

<u>sw</u>itch <u>l</u>mu *acs_id*

Options

acs_id
> specifies the ACS to switch ACS management from the master to the standby LMU.

Usage

Use the <u>sw</u>itch <u>l</u>mu command to manually switch ACS management from the ACS's master LMU to the standby LMU. Before you enter a <u>sw</u>itch <u>l</u>mu command, make sure that:

- ACSLS is in run state
- The ACS you specify is in online or diagnostic state
- At least one port is online to each LMU

Examples   In dual–LMU configurations, you can use the <u>switch</u> <u>l</u>mu command to switch ACS management from the ACS's master LMU to the standby LMU. Assume the following dual-LMU configuration:

- LMU A is in the master role and LMU B is in the standby role.

- Both LMUs manage ACS 0.

- The ports to LMU A have port IDs 0,0 and 0,1.

The following procedure tells how to use the <u>switch</u> <u>l</u>mu command to let you replace a LAN cable between the LMUs.

➪ **To replace a LAN cable between dual LMUs configured as described above, do the following:**

1. Switch to LMU B:

   switch lmu 0

2. Vary the ports to LMU A offline:

   vary port 0,0 0,1 offline

3. Replace the LAN cable.

4. Vary the ports to LMU A back online:

   vary port 0,0 0,1 online

5. Switch back to LMU A:

   switch lmu 0

See Also

For information about...	See...
Displaying LMU status	query lmu command on page 441
Displaying ACS status	query acs command on page 431
Displaying port status	query port command on page 458
Displaying ACSLS and library status	query server command on page 465
Changing the state of a library component	vary command on page 498
Starting ACSLS request processing	start command on page 488
Restarting ACSLS	"Starting ACSLS" on page 6

Command Area Messages

Success Messages

```
Switch: Switch lmu completed for acs_id, Success.
```

> **Explanation:** ACSLS switched ACS management from the master to the standby LMU.
>
> **Variable:** *acs_id* is the ACS whose LMUs switched roles.

Intermediate Messages

```
Switch: Switch lmu initiated for acs_id, Success.
```

> **Explanation:** ACSLS started switching ACS management from the master to the standby LMU.
>
> **Variable:** *acs_id* is the ACS whose LMUs are switching roles.

Error Messages

`Switch: Switch lmu failed,` *`acs_id`* `not found.`

> **Explanation:** You specified an invalid ACS.
>
> **Variable:** *acs_id* is the ACS identifier you specified on the `switch lmu` command.

`Switch: Switch lmu failed,` *`acs_id`* `is offline.`

> **Explanation:** You specified an ACS that is offline. Use the `vary` command to vary the ACS to online or diagnostic mode.
>
> **Variable:** *acs_id* is the ACS identifier you specified on the `switch lmu` command.

`Switch: Switch lmu failed,` *`acs_id`* `not configured for dual lmu.`

> **Explanation:** You specified an ACS that is not configured with master and standby LMUs. Either:
>
> - Reconfigure the specified ACS, then reenter the `switch lmu` command
>
> - Enter a `switch lmu` command that specifies an LMU that is configured with master and standby LMUs.
>
> **Variable:** *acs_id* is the ACS identifier you specified on the `switch lmu` command.

`Switch: Switch lmu failed, not communicating.`

> **Explanation:** An LMU switch failed because the standby LMU is not communicating. Check the standby LMU for communications problems.

`Switch: Switch lmu failed, switch already active.`

> **Explanation:** An LMU switch is in progress for the ACS you specified. Wait until the switch completes, then, if desired, reenter the `switch lmu` command.

```
Switch: Switch lmu failed, port is offline.
```

Explanation: You specified an ACS with no LMU ports online
Vary at least one port online to each LMU.

Display Area   None.
Messages

unlock

The <u>un</u>lock command removes active locks (associated with your current lock ID) on a specified transport or volume or removes all active locks.

Format

<u>un</u>lock *type identifier*...|<u>al</u>l

Options

type identifier
    specifies a library component. Table 29. lists the components that you can unlock.

Table 29. Valid Components for Unlock

Library Component	*type*	*identifier*
transport	<u>dr</u>ive	*drive_id*
volume	<u>vo</u>lume	*vol_id*

<u>al</u>l   specifies all active locks.

Usage   Use the <u>un</u>lock command to remove active locks on specified volumes and transports or remove all active locks. The lock ID of the component must match your current lock ID.

When you unlock a component that is not in use, ACSLS checks for pending locks on the component. If there is a pending lock, ACSLS locks the component with the lock ID of the pending lock.

Note: The <u>un</u>lock command always resets your lock ID to 0.

Examples   To remove active locks on transport 0,0,2,0:

```
unlock drive 0,0,2,0
```

To remove active locks on all locked volumes:

```
unlock volume all
```

See Also

For information about...	See...
Removing all active or pending locks on a specified transport or volume	clear lock command on page 380
Locking transports and volumes	lock command on page 408
Displaying the lock status of a transport or volume	query lock command on page 444
Setting your lock ID	set lock command on page 480
Displaying your lock or user ID	show command on page 486

**Command Area
Messages**

Success Messages

> Unlock: Unlock completed, Success.
>   Unlock: drive *drive_id* unlocked.

> > **Explanation:** ACSLS unlocked the specified transport.
> >
> > **Variable:** *drive_id* is the unlocked transport.

> Unlock: Unlock completed, Success.
>   Unlock: volume *vol_id* unlocked.

> > **Explanation:** ACSLS unlocked the specified volume.
> >
> > **Variable:** *vol_id* is the unlocked volume.

**Intermediate
Messages**   None.

Error Messages

> Unlock: Unlock of transport *drive_id* failed, *status*.

> > **Explanation:** ACSLS cannot unlock the transport.
> >
> > **Variable:** *status* is the reason for the failure. For more
> > information on common status messages, see *ACSLS Messages*.

> Unlock: Unlock of volume *vol_id* failed, *status*.

> > **Explanation:** ACSLS cannot unlock the volume.
> >
> > **Variable:** *status* is the reason for the failure. For more
> > information on common status messages, see *ACSLS Messages*.

**Display Area
Messages**   None.

---

vary

The <u>va</u>ry command changes the state of a library component.

Format

<u>va</u>ry *type identifier*...*state* [<u>f</u>orce]

Options

type [*identifier*]
> specifies a library component. Table 30. lists the components you can vary.

Table 30. Valid Components for Vary

ACS Component	*type*	*identifier*
ACS	<u>ac</u>s	*acs_id*
LSM	<u>l</u>sm	*acs_id*,*lsm_id*
CAP	<u>ca</u>p	*cap_id*
transport	<u>dr</u>ive	*drive_id*
port	<u>por</u>t	*port_id*

state
> specifies one of the following device states: <u>on</u>line (online to clients and cmd_proc), <u>of</u>fline, or <u>dia</u>gnostic (online to cmd_proc only).
>
> You can vary an ACS, LSM, CAP, or transport online, offline, or diagnostic. You can vary a port either online or offline. See "Usage" for more information about device states.

<u>f</u>orce
> varies an ACS, LSM, CAP, or transport <u>of</u>fline after processing only the current robotic request.

Usage   Use the <u>va</u>ry command to change the state of an ACS, LSM, CAP, transport, or port. The following sections tell how each of the device states you can specify affects library components.

vary offline   Table 31. shows the results of <u>va</u>ry <u>of</u>fline for each ACS component. When you vary a component offline and it first goes to offline-pending state, ACSLS processes all active and pending requests for the component, rejects new requests, then varies the component offline.

Table 31. Vary offline Results

ACS Component	Results
ACS	ACS and subcomponents go offline–pending, then offline. LSMs must go offline before the ACS goes offline.
LSM	LSM goes offline–pending, then offline.
CAP	CAP goes offline–pending, then offline.
transport	If available, transport goes offline immediately. If in use, transport stays online.

port	Port goes offline immediately if:
	         – ACS has other ports online, or
	         – ACS is offline.
	Otherwise, the port stays online.

vary offline force

Table 32. shows the results of <u>vary</u> <u>off</u>line <u>f</u>orce for each ACS component. This option is useful if the device must be taken to the offline state while it is involved in extended activity (for example, during an audit).

Table 32. Vary offline force Results

ACS Component	Results
ACS	Only the current robotic request completes, then the ACS and subcomponents go offline immediately. Pending requests are discarded and new requests are rejected. LSMs must go offline before the ACS goes offline.
LSM	Only the current robotic request completes, then the LSM goes offline immediately. Pending requests are discarded and new requests are rejected.
CAP	Only the current robotic request completes, then the CAP goes offline immediately. Pending requests are discarded and new requests are rejected.
transport	Only the current robotic request completes, then the transport goes offline immediately. Pending requests are discarded and new requests are rejected.
port	Not valid.

vary diagnostic   The vary diagnostic request places the specified component in the diagnostic state (online to cmd_proc only). ACSLS processes all active and pending requests for the component, rejects new client application requests, then varies the component to diagnostic state. For an ACS, all of its subordinate LSMs are also varied to diagnostic.

vary online   Table 33. shows the results of vary online for each ACS component. When you vary a component online and it first goes to recovery state, ACSLS processes all active and pending requests for the component, rejects new requests, then varies the component online. When the component goes to online, ACSLS processes all requests for the component.

Table 33. Vary online Results

ACS Component	Results
ACS	If ACS is offline, ACS and its LSM go to recovery, then online. If ACS is in diagnostic state, ACS and its LSM go to online immediately..
LSM	LSM goes to recovery, then online. You cannot vary an LSM online if it is attached to an offline ACS.
CAP	CAP goes to recovery, then online.
transport	Transport goes to recovery, then online.
port	Port goes online immediately.

Examples   To vary transport 0,0,9,3 offline:

`vary drive 0,0,9,3 offline`

To vary CAP 0,0,0 diagnostic:

`vary cap 0,0,0 diagnostic`

To force lsm 0,1 offline:

`vary lsm 0,1 offline force`

Notes   IPLing the system does not change the state of these
components. Installing or reconfiguring ACSLS places all
components in the online state wherever possible.

See Also

For information about...	See...
Displaying the status of a library component	`query` commands on page 429

Command Area Messages

Success Messages

`Vary: `*`type identifier`*` Varied `*`state`*

Explanation: ACSLS changed the state of the specified library
component.

Variable:

- *`type`* is the library component type.

- *`identifier`* is the library component identifier.

- *`state`* is the new stat of the library component.

Intermediate Messages   None.

Error Messages

```
In-transit cartridge recovery incomplete.
```

>   **Explanation:** The LSM robot cannot dispose of in-transit
>   volumes while the LSM or its ACS is varied online. If you are
>   varying an ACS online, the ACS state is changed to online
>   immediately, but any LSMs that are unable to complete
>   in-transit volume recovery remain offline.

```
Vary: Vary type identifier failed, Drive in use.
```

>   **Explanation:** ACSLS cannot change the state of the specified
>   library component because the command involved an in–use
>   transport.
>
>   **Variable:**
>
>   - *type* is the library component type.
>
>   - *identifier* is the library component identifier.

```
Vary: Vary type identifier failed, Incorrect lockid
```

>   **Explanation:** ACSLS cannot change the state of the specified
>   library component because the transport *lock_id* does not
>   match your *lock_id*..
>
>   **Variable:**
>
>   - *type* is the library component type.
>
>   - *identifier* is the library component identifier.

Vary: Vary *type* *identifier* failed, State unchanged.

> **Explanation:** ACSLS cannot change the state of the specified library component because the component is already in the requested state.
>
> **Variable:**
>
> - *type* is the library component type.
>
> - *identifier* is the library component identifier.

Vary: Vary *type* *identifier* failed, Vary disallowed.

> **Explanation:** ACSLS cannot change the state of the specified library component because a vary diagnostic request was issued from a client application.
>
> **Variable:**
>
> - *type* is the library component type.
>
> - *identifier* is the library component identifier.

Vary: Vary *type* *identifier* failed, Incorrect state.

> **Explanation:** ACSLS cannot change the state of the specified library component because you tried to vary:
>
> - A CAP online when the LSM or ACS is in the diagnostic or offline state.
>
> - A CAP diagnostic when the LSM or ACS is offline.
>
> - An LSM online when the ACS is in the diagnostic or offline state.
>
> - An LSM diagnostic if the ACS is offline.
>
> **Variable:**
>
> - *type* is the library component type.
>
> - *identifier* is the library component identifier.

`Vary: Vary ` *`type identifier`* `failed, Vary in progress.`

> **Explanation:** ACSLS cannot change the state of the specified library component because
>
> - A CAP and the CAP or its LSM or ACS is in a transitory (recovery or offline–pending) state.
>
> - An LSM and the LSM, its ACS, or a subordinate CAP is in a transitory state.
>
> - An ACS and the ACS, a subordinate LSM, or a subordinate CAP is in a transitory state.
>
> - An ACS, LSM, or CAP to the diagnostic or online state and a `vary offline/force` request overrode the attempt.
>
> - A transport which is in a transition state of recovery.
>
> **Variable:**
>
> - *`type`* is the library component type.
>
> - *`identifier`* is the library component identifier.

`Vary: Vary ` *`type identifier`* `failed, State unchanged.`

> **Explanation:** ACSLS cannot change the state of the specified library component because you tried to vary an ACS, LSM, or CAP offline and a `vary offline/force` request overrode the attempt.
>
> **Variable:**
>
> - *`type`* is the library component type.
>
> - *`identifier`* is the library component identifier.

```
Vary: Vary type identifier failed, ACS online.
```

> **Explanation:** ACSLS cannot change the state of the specified library component because you tried to vary the last port offline in an online ACS.
>
> **Variable:**
>
> - *type* is the library component type.
> - *identifier* is the library component identifier.

```
Vary: Vary type identifier failed, No ports online.
```

> **Explanation:** ACSLS cannot change the state of the specified library component because there are no ports online for an ACS.
>
> **Variable:**
>
> - *type* is the library component type.
> - *identifier* is the library component identifier.

Display Area Messages   One of the following messages appears when an ACS, LSM, transport, or port changes state.

```
ACS acs_id: state
LSM lsm_id: state
Drive drive_id: state
Port port_id: state
```

The following message appears if, during recovery of in-transit volumes, a cartridge label is unreadable or duplicate. The cartridge is moved to the CAP.

```
CAP cap_id.  Remove cartridges from CAP.
```

cap_id is the CAP containing the cartridges.

venter

The <u>ve</u>nter command makes a CAP ready to enter unlabeled cartridges into the library.

Format

<u>ve</u>nter *cap_id vol_id*

Options

cap_id
    specifies the CAP through which the cartridges are to be entered.

vol_id
    specifies the virtual labels of the volumes to be entered.

Usage   Use the <u>ve</u>nter command to make a CAP ready to enter cartridges with missing or unreadable labels into the library. You specify virtual labels (volume IDs) on the <u>ve</u>nter command, which adds volume information to the ACSLS database. From one to 42 volumes can be entered at a time.

Unless the media type is "3480", you cannot venter a volume that has no separate media type label.

Cautions:

- ACSLS only supports the <u>ve</u>nter command for SCSI-attached LSMs when both:

    ○ the cartridge being ventered has a media label, and

    ○ the cartridge's media label is compatible with drives attached to the SCSI library.

- Unless the volume's media type is 3480, you cannot venter a cartridge without a separate media label.

- Cartridges entered into an L5500 must have a separate media label.

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- Use the <u>venter</u> command to enter cartridges with missing or unreadable labels. Do *not* open the LSM door and place cartridges with missing or unreadable labels in a storage cell because ACSLS cannot manage these cartridges. During an audit, ACSLS will eject volumes with missing or unreadable labels and no virtual labels.

- The <u>venter</u> command does not provide an option to specify the media type of the cartridge you want to enter. In a mixed-media environment, ACSLS cannot prevent transport/media incompatibilities for virtually entered cartridges!

For procedures for entering unlabeled cartridges, see the following:

- "Entering Cartridges with Virtual Labels (Serial–Attached LSMs)" on page 248

- "Entering Cartridges with Virtual Labels (SCSI–Attached LSMs)" on page NO TAG

Examples To assign virtual labels to volumes MAINT1 and MAINT2 and enter these volumes through CAP 0,2,2:

venter 0,2,2 MAINT1 MAINT2

See Also

For information about...	See...
Cancelling a command	<u>can</u>cel command on page 375
Displaying CAP status	<u>q</u>uery <u>cap</u> command on page 433
Setting CAP selection priority	<u>set</u> <u>cap</u> <u>pri</u>ority command on page 474
Setting CAP mode (manual or automatic)	<u>set</u> <u>cap</u> <u>mod</u>e command on page 471
Making a CAP (manual mode) ready to enter labelled cartridges into the library	<u>en</u>ter command on page 400
Mounting a data volume on a transport	<u>mou</u>nt command on page 413
Creating or modifying scratch pools	<u>def</u>ine <u>poo</u>l command on page 383
Mounting a scratch volume on a transport	<u>mou</u>nt <u>*</u> command on page 418
Ejecting volumes from the library	<u>ej</u>ect command on page 394

**Command Area
Messages**

Success Messages

`Venter: Enter complete,` *nn* `cartridges entered.`

> **Explanation:** ACSLS entered the displayed number of
> cartridges.
>
> **Variable:** *nn* is the total number of cartridges entered.

`Venter:` *vol_id* `Entered through` *cap_id*

> **Explanation:** ACSLS entered the specified virtual volume.
>
> **Variable:**
>
> - *vol_id* is the virtual volume label.
>
> - *cap_id* is the CAP through which the volume was entered.

Intermediate   None.
Messages

Error Messages

`Venter:` *vol_id* `Enter failed,` *status*

> **Explanation:** ACSLS did not enter the specified virtual
> volume.
>
> **Variable:**
>
> - *vol_id* is the virtual volume label.
>
> - The *status* is the translated completion status of the
>   request returned by ACSLS.

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**Display Area
  Messages**

CAP *cap_id:* Place cartridges in CAP.

>> **Explanation:** The CAP is ready for cartridge entry. Open the CAP and enter cartridges.
>>
>> **Variable:** *cap_id* s the CAP used to enter cartridges.

CAP *cap_id:* Unknown media type label.

>> **Explanation:** One or more cartridges cannot be entered because the media type is unknown.
>>
>> **Variable:** *cap_id* s the CAP used to enter cartridges. Open the CAP and remove the cartridges.

Chapter 15. Display Command Reference

The display command is a powerful tool for reporting
information from the ACSLS database. Like a SQL SELECT
statement, display allows you to specify:

- the database table (ACSLS object) you want to display

- wildcards

- conditions that objects must meet to be selected

- fields to report and the order in which they will be reported

- the sort order in which output will be displayed

- that only the count of the number of objects meeting the
  selection criteria be displayed

The result is a customizable query facility that lets customers
specify what they want display and how it should be presented.
Much more information is available through the display
command than is possible through ACSLS query commands.
For example, `display volume` gives access to volume
information that was only available through a custom volrpt.
`display lsm` and `display drive` provide LSM and tape drive
serial numbers.

The display commands are:

`display cap`
>   Displays specific CAP information based on the options
>   selected.

<u>display</u> cell
>   Displays specific cell information based on the options
>   selected.

<u>display</u> drive
>   Displays specific drive information based on the options
>   selected.

<u>display</u> lock
>   Displays specific lock information based on user ID.

<u>display</u> lsm
>   Displays specific LSM information based on the options
>   selected.

<u>display</u> panel
>   Displays specific library panel information based on the
>   options selected.

<u>display</u> pool
>   Displays specific scratch pool information based on the
>   options selected.

<u>display</u> port
>   Displays specific port information based on the options
>   selected.

<u>display</u> volume
>   Displays specific volume information based on the options
>   selected.

display commands

The `display` command displays various fields of information for different library components. The display command allows you to select the order and format in which the output is displayed.

Wildcards, numeric or alpha ranges, and selection lists can be used with the display command.

Using Wildcard Characters

The wildcard character, *****, can be used to substitute: for certain display operands; for one or more subfields in compound display operands; or at the beginning or end of a volume ID. It must match one or more characters.

Use ' _' to match a single character in a *vol_id*. The '_' is positional, and represents a single character. It may be used more than once in a vol_id to represent more than one character.

- Examples of valid wildcards using the * character:

    display cap * (displays all CAPs)

    display volume *100 (displays all volumes ending in 100)

    display drive * -volume RB0001 (displays the drive(s) that contain volume RB0001)

It is invalid to use the wildcard character, *: as part of a range; as one of multiple type operands; or embedded within a *vol_id*. Use ' _' to specify a single embedded character in a *vol_id*.

- Examples of invalid wildcards using the * character:

    display cap * * (Only one ***** is allowed when selecting all objects)

    display volume 1*111 (The embedded ***** is not allowed. Use **display volume 1_111** instead).

Using Ranges:

A range is denoted as "–". Rules for using ranges are

- Negative numbers are not allowed, except for volume home location.

- <n and >n are allowed. <n is all numerics less than n. >n is all numerics greater than n.

- Multiple numbers or ranges can be used, separated by a white space.

- Volume ranges can be alphanumeric.

Examples of valid ranges:

> **display volume * –drive 0,1,2,2–5** (displays all volumes in acs 0, lsm 1, panel 2, drives 2 through 5)

> **display lsm * –state online –free_cells >50 –type 9730** (displays all 9730 lsms in an online state with a freecell count greater than 50)

Examples of invalid ranges:

> **display drive 0,1,1,1–*** (* is not valid in a range)

> **display volume * –drive 0,1,?,1–5** (? is not valid in a range)

Format

```
display type arg ... [ –selection ... ]
 [ [ –c ] | [ –f field ... ] [ –s sort_field ... ]
   [ –n n ] ]
```

Options

type
> specifies the object to be displayed. Valid types are: cap, cell, drive, lock, lsm, panel, pool, port, and volume.

---

arg
> (argument) specifies the identifiers for the object type. Only objects that match one or more of the identifiers are returned.

-selection
> specifies additional selection criteria. To be selected, a component must match at least one of the selection identifiers for each selection criteria.

-c
> (count) causes the request to display only the number of objects that satisfy the *arg* and *selection* criteria. This option is mutually exclusive with the –f field, –s sort_field, and –n *n* options.

-f field
> specifies the fields of information to be returned and the order in which they are to be returned for each object selected. Each display type has a list of available, key, and default fields. If ‑f is specified, the default fields are not displayed unless they are key fields or have been specified. If ‑f is not specified, then the default fields are returned. Key fields for each type are normally displayed first. However, you can change the order in which the key fields are displayed by specifying them after the –f option.

-s sort_field
> sorts the objects returned by the field(s) selected in the order specified. The default sort order for each display command is discussed under each command. Sorting is based on internal database values and may not always display in alphanumeric order.
>
> All returned fields for a type are valid sort_fields.

-n n
> specifies the maximum number of objects to be displayed.

display cap

The `display cap` command displays specific CAP information based on the options selected.

Format

display cap *cap_id* ... [–status *cap_status* ...] [–priority *cap_priority* ...] [–state *cap_state* ...] [–manual | – automatic] [–condition *cap_condition* ...] [[–c] | [–f *field* ...] [–s sort_field ...] [–n *n*]]

Fields

The fields for `display cap` are:

- key fields: acs, lsm, cap

- default fields: acs, lsm, cap, status, priority, state, mode, size

- returned fields: acs, lsm, cap, status, priority, state, mode, size, condition

Options

cap_id

specifies the CAP(s) to display. A cap_id is of the format: *acs, lsm, cap*.

Wildcard character ,*****, can be used in any cap_id subfield or used to represent all subfields. However, if it is used to represent all cap_ids (example: *display cap ** or *display cap *,*,**), additional cap_id's (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of cap_id.

–status *cap_status*

specifies one or more CAP statuses as additional selection criteria. CAP statuses are: audit, available, eject, enter, insert_magazines.

–priority *cap_priority*

specifies one or more CAP priorities. Numeric range rules apply. CAP numeric ranges: 0–16.

-state *cap_state*
>   specifies one or more CAP states. CAP states are:
>   diagnostic, offline, offline_pending, online, recovery.

-manual
>   selects CAPs in manual mode.

-automatic
>   selects CAPs in automatic mode.

-condition *cap_condition*
>   specifies one or more CAP conditions from which to
>   select. Valid conditions are: inoperative, maint_required,
>   or operative.

-c

>   (count) causes the request to display only the number of
>   objects that satisfy the *arg* and *selection* criteria. This
>   option is mutually exclusive with the –f field, –s sort_field,
>   and –n *n* options.

-f *field*
>   specifies the fields of information to be returned and the
>   order in which they are to be returned for each object
>   selected. Each display type has a list of available, key, and
>   default fields. If –f is specified, the default fields are not
>   displayed unless they are key fields or have been specified.
>   If –f is not specified, then the default fields are returned.
>   Key fields for each type are normally displayed first.
>   However, you can change the order in which the key fields
>   are displayed by specifying them after the –f option.

-s *sort_field*
>   sorts the objects returned by the field(s) selected in the
>   order specified. Sorting is based on internal database
>   values and may not always display in alphanumeric order.
>
>   All returned fields for a type are valid sort_fields.

-n *n*
>   specifies the maximum number of objects to be displayed.

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Examples   To display CAP data for ACS 1, LSM 1, CAP 1:

```
display cap 1,1,1
```

To display all manual mode CAPs in LSM 1, 0:

```
display cap 1,0,* -manual
```

To display all CAPs in an offline pending state:

```
display cap * -state offline_pending
```

display cell

The `display cell` command displays specific information about a cell based on the options selected.

Format   display cell–id *cell_loc* ... [–status *cell_status* ...] [[–c] |
[–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields   The fields for `display cell` are:

- key fields: acs, lsm, panel, row, column,

- default fields: acs, lsm, panel, row, column, status

- available fields: acs, lsm, panel, row, column, status

Options

–status *cell_status*

specifies one or more cell statuses as additional selection criteria. Valid cell statuses: empty, full, inaccessible, reserved.

Wildcard character ,*****, can be used in any cell_id subfield or used to represent all subfields. However, if it is used to represent all cell_ids (example: *display cell ** or *display cell_id *,*,**), additional cell_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of cell_id.

–c

(count) causes the request to display only the number of objects that satisfy the *arg* and *selection* criteria. This option is mutually exclusive with the –f field, –s sort_field, and –n *n* options.

-f *field*

> specifies the fields of information and the order in which they are to be returned for each object selected. Each display type has a list of available, key, and default fields. If -f is specified, the default fields are not displayed unless they are key fields or have been specified. If -f is not specified, then the default fields are returned. Key fields for each type are normally displayed first. However, you can change the order in which the key fields are displayed by specifying them after the –f option.

-s *sort_field*

> sorts the objects returned by the field(s) selected in the order specified. Sorting is based on internal database values and may not always display in alphanumeric order.
>
> All returned fields for a type are valid sort_fields.

-n *n*

> specifies the maximum number of objects to be displayed.

Example   To display information for cells with a reserved status:

```
display cell * -status reserved
```

display drive

The `display drive` command displays specific drive information based on the options selected.

Format   display drive *drive_id* ... [–status *drive_status* ...] [–state *drive_state* ...] [–type *drive_type* ...] [–volume *vol_id* ...] [–lock *lock_id...*] [–serial *drive_serial_num* ...] [–condition *drive_condition* ...] [[–c] | [–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields   The fields for `display drive` are:

- key fields: acs, lsm, panel, drive

- default fields: acs, lsm, panel, drive, status, state, volume, type

- available fields: acs, lsm, panel, drive, status, state, volume, type, lock, serial_num, condition

Options

drive_id
> displays the drive_id in the following format: *acs, lsm, panel, drive*.
>
> Wildcard character ,*****, can be used in any drive_id subfield or used to represent all subfields. However, if it is used to represent all drive_ids (example: *display drive ** or *display drive_id *,*,**), additional drive_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of drive_id.

–status *drive_status*
> displays one of the following statuses as additional selection criteria: available, in_use, reserved

–state *drive_state*
> displays the following states for one or more drives: diagnostic, online, offline, recovery.

-type *drive_type*
> displays drives by transport type.

-volume *vol_id*
> displays volume(s) mounted on the drive(s) selected. A vol_id can be a 6–alphanumeric string or wildcard string that specifies a tape cartridge volume or range of volume IDs.

-lock *lock_id*
> displays drive information on locked drives by lock ID.

-serial *drive_serial*_num
> specifies the drive serial number.

-condition *drive_condition#*
> displays condition of the drive(s) specified. Valid conditions are: operative, inoperative, or maint_required.

-c
> (count) causes the request to display only the number of objects that satisfy the *arg* and *selection* criteria. This option is mutually exclusive with the –f field, –s sort_field, and –n *n* options.

-f *field*
> specifies the fields of information and the order in which they are to be returned for each object selected. Each display type has a list of available, key, and default fields. If -f is specified, the default fields are not displayed unless they are key fields or have been specified. If -f is not specified, then the default fields are returned. Key fields for each type are normally displayed first. However, you can change the order in which the key fields are displayed by specifying them after the –f option.

-s *sort_field*
> sorts the objects returned by the field(s) selected in the order specified. Sorting is based on internal database values and may not always display in alphanumeric order.
>
> All returned fields for a type are valid sort_fields.

−n *n*
    specifies the maximum number of objects to be displayed.

Examples   To display a maximum of 56 rows for all drives in ACS 1, sorted by panel and drive:

```
display drive 1,*,*,* -s panel drive -n 56
```

To display drive data for ACS 1, LSM 1, with status available:

```
display drive 1,1,*,* -status available
```

To display drive types and serial numbers for all drives:

```
display drive *,*,*,* -f type serial_num
```

display lock

The `display lock` command displays specific lock information by *lock_id* based on the options selected.

Format   display lock *lock_id* ... [–user *user_id* ...] [[–c] |
[–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields   The fields for `display lock` are:

- key fields: lock_id

- default fields: lock_id, user_id

- available fields: lock_id, user_id

Options

`lock_id`
> displays the numeric lock_id.
>
> Wildcard character ,*****, can be used in any lock_id subfield or used to represent all subfields. However, if it is used to represent all lock_ids (example: *display lock * or display lock_id *,*,**), additional lock_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of lock_id.

`user_id`
> specifies the user name (example: acsss) that has locked the volume or transport. The `user_id` wraps after 80 characters.

`–c`
> (count) causes the request to display only the number of objects that satisfy the *arg* and *selection* criteria. This option is mutually exclusive with the –f field, –s sort_field, and –n *n* options.

-f *field*

>   specifies the fields of information and the order in which
>   they are to be returned for each object selected. Each
>   display type has a list of available, key, and default fields.
>   If −f is specified, the default fields are not displayed unless
>   they are key fields or have been specified. If −f is not
>   specified, then the default fields are returned. Key fields
>   for each type are normally displayed first. However, you
>   can change the order in which the key fields are displayed
>   by specifying them after the –f option.

−s *sort_field*

>   sorts the objects returned by the field(s) selected in the
>   order specified. Sorting is based on internal database
>   values and may not always display in alphanumeric order.
>
>   All returned fields for a type are valid sort_fields.

−n *n*

>   specifies the maximum number of objects to be displayed.

Example   To display lock information for lock_id 2:

>   **display lock 2**

---

display lsm

The `display lsm` command displays specific LSM information based on the options selected.

Format display lsm *lsm_id* ... [–status *lsm_status* ...] [–state *lsm_state* ...] [–free_cells *cell_count* ...] [–type *lsm_type* ...] [–serial *lsm_serial_num* ...] [–condition *lsm_condition*] [–door_open | –door_closed] [[–c] | [–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields The fields for `display lsm` are:

- key fields: acs, lsm

- default fields: acs, lsm, status, state, free_cells

- available fields: acs, lsm, status, state, free_cells, type, serial_num, condition, door_status

Options

lsm_id
> displays the lsm id in the following format: *acs, lsm*.
>
> Wildcard character ,*****, can be used in any lsm_id subfield or used to represent all subfields. However, if it is used to represent all lsm_ids (example: *display lsm ** or *display lsm_id *,*,**), additional lsm_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of lsm_id.

–status *lsm_status*
> specifies one or more LSM statuses from which to select. Valid statuses are: audit, normal

–state *lsm_state*
> specifies one or more LSM states from which to select. Valid states are: diagnostic, online, offline, offline_pending, recovery.

`-free_cells` *cell_count*
>   selects LSMs by the number of free cells.

`-type` *lsm_type*
>   displays LSMs by type.

`-serial` *lsm_serial*_num
>   displays serial numbers for selected LSMs.

`-condition` *lsm_condition*
>   displays condition of the selected LSMs. Valid conditions
>   are: operative, inoperative, or maint_required.

`-door_open`
>   displays LSMs with open doors.

`-door_closed`
>   displays LSMs with closed doors.

`-c`
>   (count) causes the request to display only the number of
>   objects that satisfy the *arg* and *selection* criteria. This
>   option is mutually exclusive with the –f field, –s sort_field,
>   and –n *n* options.

`-f` *field*
>   specifies the fields of information and the order in which
>   they are to be returned for each object selected. Each
>   display type has a list of available, key, and default fields.
>   If `-f` is specified, the default fields are not displayed unless
>   they are key fields or have been specified. If `-f` is not
>   specified, then the default fields are returned. Key fields
>   for each type are normally displayed first. However, you
>   can change the order in which the key fields are displayed
>   by specifying them after the –f option.

`-s` *sort_field*
>   sorts the objects returned by the field(s) selected in the
>   order specified. Sorting is based on internal database
>   values and may not always display in alphanumeric order.
>
>   All returned fields for a type are valid sort_fields.

-n *n*
    specifies the maximum number of objects to be displayed.

Example   To display information for all LSMs in the library for type
9714:

```
display lsm * -type 9714
```

display panel

The `display panel` command displays specific library panel information based on the options selected.

Format   display panel *panel_id* ...[–type *panel_type* ...]
  [[–c] | [–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields   The fields for `display panel` are:

- key fields: acs, lsm, panel

- default fields: acs, lsm, panel, type

- available fields: acs, lsm, panel, type

Options

`panel_id`
> displays the panel id in the following format: *acs, lsm, panel*.
>
> Wildcard character ,*****, can be used in any panel_id subfield or used to represent all subfields. However, if it is used to represent all panel_ids (example: *display panel ** or *display panel_id *,*,**), additional panel_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of panel_id.

`–type panel_type`
> specifies one or more valid panel types.

`–c`
> (count) causes the request to display only the number of objects that satisfy the *arg* and *selection* criteria. This option is mutually exclusive with the –f field, –s sort_field, and –n *n* options.

-f *field*

  specifies the fields of information and the order in which they are to be returned for each object selected. Each display type has a list of available, key, and default fields. If −f is specified, the default fields are not displayed unless they are key fields or have been specified. If −f is not specified, then the default fields are returned. Key fields for each type are normally displayed first. However, you can change the order in which the key fields are displayed by specifying them after the –f option.

−s *sort_field*

  sorts the objects returned by the field(s) selected in the order specified. Sorting is based on internal database values and may not always display in numeric order.

  All returned fields for a type are valid sort_fields.

−n *n*

  specifies the maximum number of objects to be displayed.

Example Display panel data for all panels:

  display panel *

display pool

The `display pool` command displays specific scratch pool information based on the options selected.

Format display pool *pool_id* ... [–low_water low_water_mark ... | –high_water high_water_mark...] [–overflow | –no_overflow] [[–c] | [–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields The fields for `display pool` are:

- key fields: pool_id

- default fields: pool_id, low_water, high_water, overflow

- available fields: pool_id, low_water, high_water, overflow

Options

`pool_id`
> displays the pool id of a scratch pool.
>
> Wildcard character ,*****, can be used in any pool_id subfield or used to represent all subfields. However, if it is used to represent all pool_ids (example: *display pool ** or *display pool_id *,*,**), additional pool_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of pool_id.

`-low_water low_water_mark`
> specifies the minimum number of scratch volumes in the pool. If a low_water mark is displayed with a hyphen (–) appended to it, the number of volumes in the library for the selected scratch pool is within the designated low_water mark.

-high_water high_water_mark
>   specifies the maximum number of scratch volumes in the
>   pool. If a high_water mark is displayed with a hyphen (–)
>   appended to it, the number of volumes in the library for the
>   selected scratch pool is within the designated high_water
>   mark.

-overflow
>   selects pools wherein if a scratch mount is requested and if
>   the pool is empty, the common pool is used to satisfy the
>   request.

-no_overflow
>   selects pools wherein if a scratch mount is requested and if
>   the pool is empty, the mount fails without checking the
>   common pool for available tapes.

-c
>   (count) causes the request to display only the number of
>   objects that satisfy the *arg* and *selection* criteria. This
>   option is mutually exclusive with the –f field, –s sort_field,
>   and –n *n* options.

-f *field*
>   specifies the fields of information and the order in which
>   they are to be returned for each object selected. Each
>   display type has a list of available, key, and default fields.
>   If −f is specified, the default fields are not displayed unless
>   they are key fields or have been specified. If −f is not
>   specified, then the default fields are returned. Key fields
>   for each type are normally displayed first. However, you
>   can change the order in which the key fields are displayed
>   by specifying them after the –f option.

-s *sort_field*
>   sorts the objects returned by the field(s) selected in the
>   order specified. Sorting is based on internal database
>   values and may not always display in numeric order.
>
>   All returned fields for a type are valid sort_fields.

-n *n*
>   specifies the maximum number of objects to be displayed.

Example   To display all information for pool 5:

```
display pool 5
```

To display all pools with overflow:

```
display pool * -overflow
```

display port

The display port command displays specific port information based on the options selected.

Format   display port *port_id* ... [–online | –offline] [–name *port_name* ...] [[–c] | [–f *field* ...] [–s *sort_field* ...] [–n *n*]]

Fields   The fields for display port are:

- key fields: acs, port

- default fields: acs, port, name, state

- available fields: acs, port, name, state

Options

port_id
>   displays the port id in the following format: *acs, port*.
>
>   Wildcard character ,*****, can be used in any port_id subfield or used to represent all subfields. However, if it is used to represent all port_ids (example: *display port * or display port_id *,*,**), additional port_ids (either numeric or *****) are not allowed. Numeric ranges apply to any subfield of port_id.

– online
>   selects and displays ports in an online state.

– offline
>   selects and displays ports in an offline state.

– name *port_name*
>   specifies the port name.

–c
>   (count) causes the request to display only the number of objects that satisfy the *arg* and *selection* criteria. This option is mutually exclusive with the –f field, –s sort_field, and –n *n* options.

`-f` *field*

specifies the fields of information and the order in which they are to be returned for each object selected. Each display type has a list of available, key, and default fields. If `-f` is specified, the default fields are not displayed unless they are key fields or have been specified. If `-f` is not specified, then the default fields are returned. Key fields for each type are normally displayed first. However, you can change the order in which the key fields are displayed by specifying them after the –f option.

`-s` *sort_field*

sorts the objects returned by the field(s) selected in the order specified. Sorting is based on internal database values and may not always display in alphanumeric order

All returned fields for a type are valid sort_fields.

`-n` *n*

specifies the maximum number of objects to be displayed.

Examples   To display all ports in an online state:

display port * -online

display volume

The `display volume` command displays specific volume information based on the options selected.

Format   display volume *vol_id* ... [–home acs,lsm,panel,row,column...] [–drive *drive_loc* ...] [–data | –scratch | –clean] [–media *media_type* ...] [–pool *pool_id...*] [–standard | –virtual] [–status *vol_status* ...] [–entry *entry_date* ...] [–access *access_date* ...] [–lock *lock_id* ...] [[–c] | [–f *field* ...] [–s *sort_field* ...] [–n *n*]] { –max_use *max_use*] [–lock_time *lock_time*]

Fields   The fields for `display volume` are:

- key field: vol_id

- default fields: vol_id, acs, lsm, panel, row, column, pool, status, media, type

- available fields: vol_id, acs, lsm, panel, row, column, drive, type, media, pool, label_type, status, entry_date, access_date, count, max_use, lock, lock_time

Options

vol_id

displays the volume(s) selected.

A vol_id can be one or more 1–6 alphanumeric strings that specifies a tape cartridge volume.

Wildcard character ,*****, can be used in any vol_id subfield or used to represent all subfields. However, if it is used to represent all vol_ids (example: *display vol ** or *display volt_id *,*,**), additional vol_ids (either alphanumeric or *****) are not allowed. Alphaumeric ranges apply to any subfield of vol_id.

-drive *drive_loc*
>   specifies drive location(s) from which to retrieve volume
>   information in the following format: *acs,lsm,panel,drive*.
>   It cannot be used with *–home.*
>
>   *drive_loc* subfields can use numeric ranges. A wildcard
>   character ,**, can be used in place of one or more *drive_loc*
>   subfields. However, if it is used to represent all operands
>   (example: *display volume RB* –drive **), additional
>   locations (either numeric or **) are not allowed. Numeric
>   range rules apply to any subfield or drive_loc.

-data
>   selects data cartridges.

-scratch
>   selects cartridges in scratch mode.

-clean
>   selects cleaning cartridges.

-media *media_type*
>   selects only volumes with the specified media type.

-pool *pool_id*
>   selects and displays volumes from scratch pools. Volumes
>   retain the ID of the scratch pool even after they have
>   changed to data volumes.

-standard
>   selects a tape(s) with a scannable volume ID label_type. It
>   cannot be used with *–virtual.*

-virtual
>   selects a tape(s) without an external volume ID label_type
>   that was entered through the venter command. It cannot
>   be used with *–standard.*

-status *vol_status*
>   valid entries are: *dismount, eject, enter, mount, home,*
>   *in_drive, move, missing, absent, ejected.*

-entry *entry_date*
    specifies the date and time the volume was entered into the
    library. It is displayed in ISO standard format.

-access *access_date*
    specifies the date and time the volume was last used. It is
    displayed in ISO standard format.

-lock *lock_id*
    specifies the lock ID for the volume.

-max_use *max_use*
    specifies the maximum number of uses for a cleaning
    volume. Non–cleaning volumes have a max_use value of
    zero.

-lock_time *lock_time*
    specifies the date and time the lock was set. It is displayed
    according to the system default format.

-c

    (count) causes the request to display only the number of
    objects that satisfy the *arg* and *selection* criteria. This
    option is mutually exclusive with the –f field, –s sort_field,
    and –n *n* options.

-f *field*
    specifies the fields of information and the order in which
    they are to be returned for each object selected. Each
    display type has a list of available, key, and default fields.
    If −f is specified, the default fields are not displayed unless
    they are key fields or have been specified. If −f is not
    specified, then the default fields are returned. Key fields
    for each type are normally displayed first. However, you
    can change the order in which the key fields are displayed
    by specifying them after the –f option.

-s *sort_field*
    sorts the objects returned by the field(s) selected in the
    order specified. Sorting is based on internal database
    values and may not always display in alphanumeric order

    All returned fields for a type are valid sort_fields.

-n *n*
> specifies the maximum number of objects to be displayed.

Examples To display all volumes entered this year:

> **display volume * -entry 2002**

To display all volumes entered in January, 2002

> **display volume * -entry 2002-01**

To display all volumes entered on January 27, 2002

> **display volume * -entry 2002-01-27**

To display all volumes entered on January 27, 2002 between
10:00 a.m. and 11:00 a.m.

> **display volume * -entry 2002-01-27:10**

To display all volumes entered between January 2002 and April
2002.

> **display volume * -entry 2002-01-2002-04**

To display all volumes entered between 6:33 a.m. and 6:57:45
April 10 (for example, you may want to do this after an outage).

> **display volume * -entry 2002-04-10:06:33:00-**
> **2002-04-10:6:57:45**

To display all volumes entered since February 25, 2002.

> **display volume * -entry >2002-02-25**

Appendix A. Second Disk Support

This chapter discusses the following:

- Configuring the second disk on Solaris 8 or 9

- De–installing the second disk on Solaris 8 or 9

- Configuring the second disk on AIX

- De–installing the second disk on AIX

Configuring the Second Disk on Solaris 8

Note: If you have already partitioned the second disk when you installed the operating system , go to "Installing ACSLS Second Disk Support" below.

If you did not partition the second disk when you installed the operating system,or you are installing a new second disk, complete this section.

Space Required by ACSLS on the Second Disk

Second disk is used to contain the transaction logs in order to assure recoverability to the most recent transaction, even in the event of primary disk failure. The storage requirements for second disk can be met with 256 MB in Partition 0 and the remainder in Partition 1.

Partitioning the Second Disk

In this procedure, you create two partitions.

⇨   **To partition the second disk:**

1. Is ACSLS running?

YES	Continue with Step 2.
NO	Go to Step 7.

2. Open a terminal or a command tool and log in as `acssa`.

3. From the cmd_proc window, idle ACSLS.

    `idle`

4. Open another command tool and log in as `acsss`.

5. Shut down ACSLS.

    `kill.acsss`

6. Shut down the database.

    `db_command stop`

7. Log in as **root**.

8. Open a terminal window. At the prompt, enter

    `format`

    The system prompts you to select a disk. On a SPARC or Ultra system, the second disk is typically c0t1d0.

9. Enter the number of the second disk (typically menu number 1).

    The Format Menu displays, shown in Figure 49.

```
     FORMAT MENU:

     disk        – select a disk
     type        – select (define) a disk type
     partition   – select (define) a partition table
     current     – describe the current disk
     format      – format and analyze the disk
     repair      – repair a defective sector
     label       – write label to the disk
     analyze     – surface analysis
     defect      – defect list management
     backup      – search for backup labels
     verify      – read and display labels
     save        – save new disk/partition definitions
     inquiry     – show vendor, product and revision
     volname     – set 8-character volume name
     quit
```

Figure 49. Format Menu

10. Enter **partition** from the Format Menu.

The Partition Menu displays, shown in Figure 50.

```
   PARTITION MENU:
   0          - change '0' partition
   1          - change '1' partition
   2          - change '2' partition
   3          - change '3' partition
   4          - change '4' partition
   5          - change '5' partition
   6          - change '6' partition
   7          - change '7' partition
   select     - select a predefined table
   modify     - modify a predefined partition table
   name       - name the current table
   print      - display the current table
   label      - write partition map and label to the disk
   quit
```

Figure 50. Partition Menu

11. Enter **print** to display the disk partitions.

The Current Partition Table displays, shown in Figure 51.

Current partition table (original):

Total disk cylinders available: 2036+2 (reserved cylinders)

Part	Tag	Flag	Cylinders	Size	Blocks
0	unassigned	wm	0-2035	1002.09MB	(2036/0/0)
1	unassigned	wm	0	0	(0/0/0)
2	unassigned	wm	0	0	(0/0/0)
3	unassigned	wm	0	0	(0/0/0)
4	unassigned	wm	0	0	(0/0/0)
5	unassigned	wm	0	0	(0/0/0)
6	unassigned	wm	0	0	(0/0/0)
7	unassigned	wm	0	0	(0/0/0)

Figure 51. Partition Table

Note: The values in your partition table might differ from those shown, depending on the size of your disk and whether you have previously partitioned it.

STOP

Warning: Modifying an existing partition will destroy any data in that partition.

12. Enter **0** to change the 0 partition.

The partition 0 table is displayed. Enter the values shown.

a. `Enter partition id tag [unassigned]:`

Accept either the default `unassigned` or enter **help** to bring up a list of available id tags.

b. `Enter partition permission flags [wm]:` **wm**

c. `Enter new starting cyl [0]:` **0**

d. `Enter partition size [0b, 0c, 0.00mb]:` **256m**

13. Enter **print** to confirm changes made to partition 0.

14. Note the number of cylinders in partition 0.

    Subtract the number of cylinders in partition 0 from the total number of disk cylinders. This number will be used in Step 15.

15. Enter **1** to change partition 1.

    The partition 1 table is displayed. Enter the values shown.

    a. `Enter partition id tag [unassigned]:`

       Accept the default.

    b. `Enter partition permission flags [wm]:`**`wm`**

    c. `Enter new starting cyl [0]:`

       To determine this value, add 1 to the highest numbered cylinder in partition 0. For example, if partition 0 contains cylinders 0–520, enter **521**

    d. `Enter partition size [0b, 0c, 0.00mb]:`

       Enter the amount displayed in `Free`.

16. Enter **print** to confirm the changes entered.

    The display should now look like the configuration shown in Figure 52.

    The remaining partitions should all be unassigned with starting cylinder of 0 and partition size of 0.

Current partition table (original):

    Total disk cylinders available: 2036 + 2 reserved cylinders

Part   Tag   Flag   Cylinders   Size   Blocks

0   unassigned   wm   0-520   256MB   (520/0/0)
1   unassigned   wm   521–2035   17xxMB   (1515/0/0)
2   unassigned   wm   0   0   (0/0/0)
3   unassigned   wm   0   0   (0/0/0)
4   unassigned   wm   0   0   (0/0/0)
5   unassigned   wm   0   0   (0/0/0)
6   unassigned   wm   0   0   (0/0/0)
7   unassigned   wm   0   0   (0/0/0)

Figure 52. Second Disk Partition Table

> **Note:** On your display, `unassigned` should appear on size
> 0 entries.

17. Enter **?** to display the partition menu.

    The `Partition Menu` appears, shown in Figure 53.

```
    PARTITION MENU:
    0           – change '0' partition
    1           – change '1' partition
    2           – change '2' partition
    3           – change '3' partition
    4           – change '4' partition
    5           – change '5' partition
    6           – change '6' partition
    7           – change '7' partition
    select      – select a predefined table
    modify      – modify a predefined partition table
    name        – name the current table
    print       – display the current table
    label       – write partition map and label to the disk
    quit
```

Figure 53. Partition Menu

18. Enter **label** from the partition menu to update the disk with the new partitions.

19. Enter **y** at the Ready to label disk, continue? prompt.

20. From the partition prompt, enter ⟦CTRL⟧+D to exit.

Creating the File Systems　　In this procedure, you create the file systems on the disk you just partitioned.

➡　**To create file systems:**

1. At the prompt, enter **y** to construct a new filesystem.

2. At the system prompt, enter

    newfs /dev/dsk/_devname1_

    where _devname1_ is c*n*t*n*d*n*s0, and c*n*t*n*d*n* matches the disk you just installed.

    For example,

    newfs /dev/dsk/c0t1d0s0

    The system may display:

    `/dev/rdsk/c0t1d0s0 last mounted as /second_disk`

3. To have second disk file systems automatically mounted on boot up, use an editor (such as vi or textedit) to edit the /etc/vfstab file to define the mount points. Note that each field is separated by tabs.

    Add entries to the file such as the following two entries:

    `/dev/dsk/c0t1d0s1  /dev/rdsk/c0t1d0s1`
    `/second_disk  ufs  1  yes  -`

    `/dev/dsk/c0t1d0s0  /dev/rdsk/c0t1d0s0`
    `/second_disk/backup ufs 1  yes  -`

4. Verify that there is a directory for your mount point /second_disk by entering

    ls -ld /second_disk

    If the directory does not exist, create one by entering

    mkdir /second_disk

    or enter an optional directory name.

5. Make sure that the second disk is mounted:

mount /second_disk

or enter the optional directory name specified in the previous step.

6. Make a directory for the backup portion of the second disk.

mkdir /second_disk/backup

This directory is the default directory for the backup portion of the second disk. You may create another directory name for second disk backups.

7. Make sure the second disk backup is mounted on the directory specified in the previous step.

mount /second_disk/backup

Installing ACSLS
Second Disk
Support

⇨   **To install second disk support:**

1. Is ACSLS running?

YES	Continue with Step 2.
NO	Go to Step 6.

2. Open a command tool and log in as acsss.

3. From the cmd_proc window, idle ACSLS.

idle

4. Shut down ACSLS.

kill.acsss

5. Shut down the database.

db_command stop

6. Log in as root.

7. Change directories.

   cd /export/home/ACSSS/install

8. Run the second disk utility.

   ./sd_mgr.sh

9. Choose **1** to install second disk:

   `1: Installation of a second database disk.`

10. When you are prompted for the directory for second disk

    support, press ⟦ENTER⟧ to accept the default of
    `/second_disk` if you used `/second_disk` as the mount
    point in your `vfstab` entry (see "Creating the File
    Systems" on page 551). If you used an optional directory
    name instead of /second_disk on page 551, enter that
    name.

11. When you are prompted for the second disk directory for

    database backups, press ⟦ENTER⟧ to accept the default of
    `/second_disk/backup` if you used
    `/second_disk/backup` as the mount point in your `vfstab`
    entry (see "Creating the File Systems" on page 551). If you
    used an optional directory name instead of
    /second_disk/backup on page 551, enter that name.

12. When you see the `Second Disk Support` menu, select **3**
    to exit the system.

    You should see a message about doing a mandatory backup
    and a prompt to insert a database backup tape.

13. Insert the tape if you need to and wait for the backup to
    complete.

14. When the prompt returns, log out.

15. Restart ACSLS.

Restarting ACSLS

⇨   **To restart ACSLS:**

1. Log in as `root`.

2. In a terminal window or at the shell prompt, enter

    `reboot`

    Note: If the `automatic startup on reboot` option was
    enabled during ACSLS installation, ACSLS is initiated
    automatically when the server system is rebooted. If this is
    the case, go to Step 3.

3. Log in as `acsss`.

4. In a terminal window or at the shell prompt, enter

    `rc.acsss`

    It takes a few seconds to start the database and return to the
    shell prompt.

5. When the shell prompt returns, log out.

6. Log back in as `acssa` to use the ACSLS software.

De-installing a Second Disk on Solaris 8

De-installing a second disk is usually done when the second disk needs to be serviced or replaced.

Caution: De-installation of the second disk should be used if there is a hardware failure of the second disk. ACSLS will not start if a hardware failure occurs.

➡️ **To de-install the second disk:**

1. If you are not already logged in as `acsss` log in as `acsss`.

2. From the cmd_proc window, idle ACSLS.

   `idle`

3. Shut down ACSLS.

   `kill.acsss`

4. Shut down the database.

   `db_command stop`

5. Log in as `root`.

6. Change directories by entering:

   `cd /export/home/ACSSS/install`

7. Run the second disk utility.

   `./sd_mgr.sh`

   This command starts the second disk manager. With this function, you can remove second disk support.

8. Enter **2** to de-install second disk support when you are prompted for a menu choice.

   `2: De-installation of a second database disk.`

Appendix A. Second Disk Support **555**

9. Respond **y** or **n** when you see the following prompt:

    `Are you de-installing a bad secondary disk?`
    `(y or n):`

    Select **y** if your second disk is damaged and
    non-functioning.

    Select **n** if your second disk is not damaged.

10. When the Second Disk Support menu appears, select 3 to
    exit the menu.

    A message and prompt display indicating you must do a
    mandatory backup and to insert a database backup tape.

11. Insert the tape and wait for the backup to complete.

    The backup takes several minutes to complete.

12. When the backup is completed, remove the backup tape
    and store it in a safe place.

13. Log out by selecting `Log Out` from the `Workspace` menu.

14. Restart ACSLS.

Configuring the Second Disk on AIX

Partitioning the Second Disk

In this procedure, you create two partitions on the second disk.

➡️ **To partition the second disk:**

1. Open a Command tool and log in as `acssa`.

2. From the cmd_proc window, idle ACSLS.
    `idle`

3. Open another command tool and log in as `acsss`.

4. Shut down ACSLS:

    kill.acsss

5. Shut down the database:

    db_command stop

6. Log in as root.

7. To determine the name of the new disk, enter

    lsdev -C -s scsi

    The system displays a list of all SCSI devices, which can include the tape drive, the internal disk drive(s), and the disk drive added for second disk support.

    Typically, the name of the second disk is hdisk1. Verify that it displays as Available.

8. At the console prompt, enter

    smitty mkvg

    The Add a Volume Group screen appears.

9. Select VOLUME GROUP name and enter

    second_disk

10. Select PHYSICAL VOLUME names and

    a. Press [[F4]].
    b. Select hdisk1.

11. Press [[ENTER]] to run the command.

    The COMMAND STATUS screen appears, and the system runs the command.

12. When the Command: OK message appears at the top of the COMMAND STATUS screen, press [[F10]] to return to the prompt.

Creating Second Disk File Systems

⇨ **To create second disk file systems:**

13. At the console prompt, enter

    smitty crjfs

    The Add a Journaled File System screen appears.

14. Select the Add a Standard Journaled File System option.

    The Volume Group Name screen appears identifying the volume group name.

15. Select second_disk and press ⟦ENTER⟧.

16. In the Size of file system (in 512-byte blocks) field, enter 921600.

17. In the MOUNT POINT field, enter **/second_disk**.

18. In the Mount AUTOMATICALLY at system restart? field, press ⟦F4⟧ select **yes**.

19. Press ⟦ENTER⟧ to run the command.

    The COMMAND STATUS screen appears, and the system runs the command.

20. When the Command: OK message appears at the top of the COMMAND STATUS screen, press ⟦F10⟧ to return to the prompt.

Mounting Second Disk File Systems

⇨   **To mount second disk file systems:**

1. At the console prompt, enter **smitty mountfs**.

   The Mount a File System screen appears.

2. In the FILE SYSTEM name field

   a. Press ⟦F4⟧.

   b. Select the item on the same line as /second_disk.

   c. Press ⟦ENTER⟧.

3. In the DIRECTORY over which to mount field

   a. Press ⟦F4⟧.

   b. Select /second_disk.

   c. Press ⟦ENTER⟧.

4. In the TYPE of file system field

   a. Press ⟦F4⟧.

   b. Select jfs.

   c. Press ⟦ENTER⟧.

5. Press ⟦ENTER⟧ to run the command.

   The COMMAND STATUS screen appears, and the system runs the command.

6. When the Command: OK message appears at the top of the COMMAND STATUS screen, press ⟦F10⟧ to return to the prompt.

Creating Second Disk Backup File Systems

➡️ **To create second disk backup file systems:**

1. At the console prompt, enter

    `smitty crjfs`

    The `Add a Journaled File System` screen appears.

2. Select the `Add a Standard Journaled File System` option.

    The `Volume Group Name` screen appears identifying the volume group name.

3. Select `second_disk` and press ⟦ENTER⟧.

4. In the `Size of file system (in 512-byte blocks)` field, enter a value determined as follows:

    ○ If the library is a 9310 (5500 volumes) or smaller, enter **5112000**.

    ○ Otherwise, multiply 400000 by the number of 9310s and enter the result. For example, if you have six 9310s, you multiply 6 x 400000 = 2400000.

    Note: If the `/second_disk/backup` file system becomes full, use `smitty chjfs` to increase the size. Increase the size to account for your system's activity and your ACSLS backup retention period (if longer than eight days).

5. In the `MOUNT POINT` field, enter **/second_disk/backup**.

6. In the `Mount AUTOMATICALLY at system restart?` field

    a. Press ⟦F4⟧**.**

    b. Select `yes`**.**

    c. Press ⟦ENTER⟧**.**

7. Press ⟦ENTER⟧ to run the command.

    The `COMMAND STATUS` screen appears, and the system runs the command.

8. When the `Command: OK` message appears at the top of the
    `COMMAND STATUS` screen, press ⟦F10⟧ to return to the
    prompt.

Mounting Second Disk Backup File Systems

⇨ **To mount second disk backup file systems:**

1. At the console prompt, enter

    smitty mountfs

    The Mount a File System screen appears.

2. In the FILE SYSTEM name field

    a. Press ⟦F4⟧.

    b. Select the item on the same line as
        /second_disk/backup.

    c. Press ⟦ENTER⟧.

3. In the DIRECTORY over which to mount field

    a. Press ⟦F4⟧.

    b. Select the item on the same line as
        /second_disk/backup.

    c. Press ⟦ENTER⟧.

4. In the TYPE of file system field

    a. Press ⟦F4⟧.

    b. Select jfs.

    c. Press ⟦ENTER⟧.

5. Press ⟦ENTER⟧ to run the command.

    The COMMAND STATUS screen appears, and the system runs
    the command.

6. When the Command: OK message appears at the top of the
    COMMAND STATUS screen, press ⟦F10⟧ to return to the
    prompt.

Installing Second Disk Support

➪ **To install the second disk:**

1. If you are not already logged in as acsss, select Log Out from the Workspace menu and then log in as acsss.

2. From the cmd_proc window, idle ACSLS.

   idle

3. Shut down ACSLS:

   kill.acsss

4. Shut down the database:

   db_command stop

5. Log in as root.

6. Change directories by entering

   cd /export/home/ACSSS/install

7. Execute the second disk utility by entering

   ./sd_mgr.sh

8. Choose **1** to install second disk:

   1: Installation of a second database disk.

9. When you are prompted for the directory for second disk support, press [[ENTER]] to accept the default of /second_disk if you used /second_disk as the mount point when you created the second disk file system (see "Creating Second Disk File Systems" on page NO TAG).

10. When you are prompted for the second disk directory for database backups, press [[ENTER]] to accept the default of /second_disk/backup if you used /second_disk/backup as the mount point when you created second disk backup file systems (see "Creating Second Disk Backup File Systems" on page NO TAG).

11. When you see the `Second Disk Support` menu, select **3** to exit the system.

    You should see a message about doing a mandatory backup and a prompt to insert a database backup tape.

12. Insert the tape if you need to and wait for the backup to complete.

13. When the prompt returns, log out.

Restarting ACSLS

⇨ **To restart ACSLS:**

1. Log in as root.

2. In a terminal window or at the shell prompt, enter

   reboot

   Note: If the automatic startup on reboot option was enabled during ACSLS installation, ACSLS is initiated automatically when the server system is rebooted. If this is the case, go to Step 6.

3. Log in as acsss.

4. In a terminal window or at the shell prompt, enter

   rc.acsss

   It takes a few seconds to start the database and return to the shell prompt.

5. When the shell prompt returns, log out.

6. Log back in as acssa to use the ACSLS software.

   This completes second disk configuration.

Importing the Database

If this is a new installation and an existing database was not exported, skip this section and go to "Verifying ACSLS Software" on page 570.

This section describes how to import and recreate the ACSLS database that you exported in Chapter 1 using the db_export.sh utility.

Hint: The procedures outlined below are for importing the database from the default tape device. Refer to "Chapter 13, "Utility Reference" for instructions on importing the database from other tape devices or from disk.

Caution: To complete the upgrade, use the db_import.sh utility to import the exported database. For more information about using the db_import.sh utility.

➩ **To import the database from tape:**

1. Determine whether you are currently the acsss user by entering

    whoami

    If the response is not acsss, log out by pressing ⟦CTRL⟧ + ⟦D⟧, then log back in as acsss.

2. Insert the exported database tape that you exported in Chapter 1 with the db_export.sh command into the tape drive.

3. Run the database db_import.sh utility by entering the following at a UNIX prompt.

    db_import.sh

    The utility displays several messages as it executes.

    This utility can take up to 15 minutes to complete.

4. Press ⟦CTRL⟧+C when you see the following message. Do
    not insert a database backup tape.

```
Prepare for database backup ...
Remove export tape.
Insert database backup tape.
[Hit RETURN to Continue or Ctrl-C to exit]
```

Verifying the Imported Databaseand Library Configuration

In this procedure you use the `acsss_config` program to verify the database and the library configuration.

➪ **To verify that the database has been imported:**

1. To run the configuration program, enter

   `acsss_config`

   The `ACSLS feature and configuration` screen appears.

2. Enter **7** to skip library ACSLS feature configuration.

   At this point, the system generates a series of messages indicating that the database is being verified.

3. Enter **n** at the prompt to skip library communication software configuration.

   ```
   Configure library communications? (y or n):
   ```

4. Enter **y** at the prompt to build/verify the library configuration.

   ```
   This step builds a database image of your
   complete library hardware configuration.
   Before proceeding, make sure that your
   library is completely configured, that all
   subsystems are functional and powered on.
   Build/Verify library configuration?
   (y or n):
   ```

5. Enter **y** when the following prompt displays:

   ```
   Library server database exists and will be
   overwritten, continue? (y or n):
   ```

   As the script builds the library configuration, it displays the following message for *each* panel in *each* LSM.

   ```
   ACS # n, LSM # nn, PANEL # nn, created
   ```

   The script also generates a library configuration report and appends it to the `/export/home/ACSSS/log/acsss_config.log` file.

6. Enter **n** at the prompt to skip CSI configuration.

   ```
   Configure client system interfaces?
   (y or n):
   ```

7. Back up the database.

   Are you backing up the database to tape?

YES	Insert a blank tape when the following message displays:

	`Prepare for database backup...`
	`Insert database backup tape`
	`Press RETURN to continue.`

	The database backup procedure bdb.acsss automatically executes and captures the configuration data to enable database journaling.
	When the database backup is completed, the following message displays:
	`Database backup successfully completed.`
NO	Press ⟦CTRL⟧+ C and then refer to bdb.acsss on page NO TAG to backup the database to disk file. Then continue with Step 9.

   Caution: The tape drive may appear idle during the backup. It may not make any sounds or flash any lights during this time. **DO NOT** remove the tape from the drive until you see the following success message indicating the backup is complete:

   ```
   Database backup successfully completed.
   ```

   STOP

   Warning: Interrupting the backup process before completion will result in a bad backup.

8. Remove the tape and store it in a safe place.

9. Run **rc.acsss** to start the server.

   If the `automatic startup on reboot` option is enabled, ACSLS is initiated automatically when the server system is rebooted.

The ACSLS is now ready for library operations. You may log out and log back in as acssa.

Verifying ACSLS Software

The IVP (Initial Verification Program) is an exerciser that is used to verify that a newly installed library is fully functional. This step is optional. It will mount and dismount specified volumes to specified drives.

To verify ACSLS, mount and dismount a volume by either:

1. Entering mount and dismount commands from a `cmd_proc` (See "Verifying ACSLS").

2. Running the Initial Verification Program (IVP) (See "Running ivp.sh to Verify ACSLS"

Verifying ACSLS

⇨ **Mount/dismount a volume to verify ACSLS:**

1. Log in as `acssa`.

2. Query the server from the `cmd_proc` by entering

   query server

   If messages are displayed indicating that the server is in recovery mode, wait for a message indicating that the server is running.

3. If ACSLS is not running, start it log in as `acsss` and start ACSLS by entering

   rc.acsss

4. Do you have at least one volume in an LSM?

YES	Continue with the procedure.
NO	Enter a volume into an LSM. For more information, see "Operator Tasks" in *ACSLS System Administrator's Guide* and continue with the procedure.

5. Mount a volume by entering:

   mount *vol_id drive_id*

Hint: Use the **q**uery **dr**ive command to get the ID of an available drive and the **q**uery **vo**lume command to get the ID of a library volume. See "Command Reference" in *ACSLS System Administrator's Guide* for more information.

6. Did you see a message indicating a successful mount?

   A successful mount message is:

   Mount: *vol_id* mounted on *drive_id*

YES	Procedure is complete.
NO	If an error message appears, run this verification procedure again, ensuring that you specified a valid, available drive and a library volume. If the mount/dismount still fails, call StorageTek for assistance.

7. Dismount the volume by entering:

   dismount *vol_id drive_id* **force**

   where *vol_id* is the volume and *drive_id* is the drive you specified in Step 5.

Running ivp.sh to Verify ACSLS

Use this optional test procedure to run the IVP program (ivp.sh) to mount and dismount a volume. You specify the volume and drive that ivp.sh uses in the ivp.dat file.

⇨ **Run** ivp.sh **to mount/dismount a volume to verify ACSLS:**

1. Open a Terminal or a Command tool.

2. Change to the directory that contains the ivp.dat file.

   cd /export/home/ACSSS/diag/data

3. Using any text editor (for example, textedit), open the ivp.dat file and enter a drive ID and volume ID in the following format at the bottom of the file:

   drive_id vol_id

   Hint: Use the **q**uery **dr**ive command to get the ID of an available drive and the **q**uery **vo**lume command to get the ID of a library volume. See "Command Reference" in *ACSLS System Administrator's Guide* for more information.

4. To start the IVP program, enter

   /export/home/ACSSS/diag/ivp/ivp.sh

   ivp.sh mounts and dismounts the volume that you specified in the ivp.dat file in about 30 seconds.

5. Did you see a message indicating a successful mount?

YES	Procedure is complete.
NO	If an error message appears, run this verification procedure again, ensuring that you specified a valid, available drive and a library volume in the ivp.dat file. If the mount/dismount still fails, call StorageTek for assistance.

ACSLS Setup for Client Communication

To set up ACSLS for client communication, you include the client host name and IP address in etc/hosts or in the NIS lookup table.

Regressing to a Previous Version of ACSLS

If for whatever reason you need to regress to a previous version of ACSLS after you install ACSLS 6.1.1, contact Central Software Support (CSS). For more information, see *Requesting Help from Software Support*.

De–Installing a Second Disk on AIX

➡️ **To de-install the second disk:**

1. If you are not already logged in as acsss, log in as acsss.

2. From the cmd_proc window, idle ACSLS.

   idle

3. Shut down ACSLS by entering

   kill.acsss

4. Shut down the database.

   db_command stop

5. Log in as root.

6. Change directories by entering

   cd /export/home/ACSSS/install

7. To execute the second disk utility, enter

   ./sd_mgr.sh

   This command starts the second disk manager. With this function, you can remove second disk support.

8. Enter **2** to de-install second disk support when you are prompted for a menu choice.

   `2: De-installation of a second database disk.`

9. Respond **y** or **n** when you see the following prompt:

   `Are you de-installing a bad secondary disk? (y or n):`

   Select **y** if your second disk is damaged and non-functioning.

   Select **n** if your second disk is not damaged and is functioning.

10. When the Second Disk Support menu appears, select 3 to exit the menu.

    A message and prompt display indicating you must do a mandatory backup and to insert a database backup tape.

11. Insert the tape and wait for the backup to complete.

    The backup takes several minutes to complete.

12. When the backup is completed, remove the backup tape and store it in a safe place.

13. Log out by selecting `Log Out` from the `Workspace` menu.

Appendix B. Troubleshooting

This chapter describes how to troubleshoot library and ACSLS errors. You can resolve some errors, but others may require assistance from StorageTek. This chapter describes the following troubleshooting topics:

- ACSLS and library hardware error recovery

- ACSLS event log

- Logs of ACSLS Installation and Utilities

- Troubleshooting Library Connections

- Verifying the SCSI Library Connection

- Recovering Errant (Lost) Volumes

- Gathering ACSLS Diagnostic Information

ACSLS and Library Hardware Error Recovery

This section describes error recovery that ACSLS and the library hardware provide. If an individual process or a non-critical library component fails, ACSLS records the error in the ACSLS event log and continues to provide library services with the unaffected parts of the system.

If a major system failure occurs, however, library operations are suspended until the error is corrected. The following sections describe how ACSLS and the library hardware respond to communications, hardware, and software failures.

Use the ACSLS event log to gather information about ACSLS and library hardware errors (see "ACSLS Event Log," below).

Communications Failures

Communications failures include the failure of communications lines between ACSLS and an LMU or between an LMU and an LCU. Either hardware or software errors can cause these communications failures.

Communications software failures also include the failure of interprocess communication between ACSLS and the CSI (client interface) or cmd_proc.

If ACSLS cannot communicate with another library component, it logs an error and retries until contact is established or until a system-defined timeout period is reached.

Hardware Failures   Hardware reliability and redundancy can allow library operations to continue even if one component fails. For example:

- A dual-LMU configuration switches to the standby LMU if the master fails; for more information, see "Managing a Dual-LMU Configuration".

- A dual-LAN client configuration switches to the backup LAN if the primary fails; for more information see "Managing a Dual-LAN Client Configuration".

Other hardware failures, however, can suspend library operations until the failed hardware is repaired or replaced. The following list describes typical hardware failures and their effect on library operations:

LSM robot failure
Complete loss of robot function makes the affected LSM unavailable.

Loss of robot hands, cameras, or lights
Library processing in an LSM can continue in a degraded mode if the robot loses only one hand, camera, or light. If both hands, cameras, or lights fail, however, the LSM becomes unavailable.

Hint: If your LSM fails and goes off line but the data path to the tape drives is still operational, you can still manually load volumes into the library drives. For more information, see "Manually Loading Volumes Into Drives In a Disabled LSM" on page 277.

CAP failure
If a CAP fails, you cannot enter and eject cartridges directly into the affected LSM through that CAP. All other library processes can continue normally. If the affected LSM has multiple CAPs, you can use another CAP. If the affected LSM is connected to another LSM via a PTP, you can use the second LSM's CAP for enter and eject operations.

Software Failures Major software failures include a system crash, a database failure, or a library configuration inconsistency. These errors result in loss of library operations in all affected ACSs. After the problem is corrected, ACSLS goes through automatic recovery procedures to restore library operations.

Tracking Software Problems ACSLS and the Operating System provide the following software facilities:

> **ACSLS event log**
>> This log contains a time-stamped history of significant events. Use it to help troubleshoot software problems. See "ACSLS Event Log" on page 579 for a detailed description of this log.

Applying Software Maintenance Please check the StorageTek Customer Resource Center (CRC) on a regular basis for fixes and enhancements to supported ACSLS releases. The CRC also has the most current versions of the ACSLS documentation.

The CRC is at http://www.support.storagetek.com/

You must login to the CRC to view product support information.

ACSLS Event Log

The ACSLS event log contains information about library events and errors. All ACSLS components log events to the event log through the centralized event logger. The base event log, which is automatically created when ACSLS is installed, is contained in the file $ACS_HOME/log/acsss_event.log which is usually /export/home/ACSSS/log/acsss_event.log

Logged events include the following:

significant events
These are normal events that can help you manage the library. For example, events are logged when an audit is initiated or terminated, a device changes state, or a CAP is opened or closed.

library errors
Both fatal and nonfatal hardware and software errors are logged. Examples include LSM failures, problems with cartridges, database errors, interprocess and library communications failures, and software failures not normally handled by the operating system.

Using the Event Log

You should browse the event log periodically to help manage ACSLS and the library. Event log entries are particularly useful after:

- An audit

- A hardware or software failure

- ACSLS recovery

See *ACSLS Messages* for descriptions of event log messages.

When you log into ACSLS as the acssa user, a window with a tail of the event log is included on the standard terminal display; for more information, see "ACSLS User IDs" on page 3.

Hint: To tail the event log from another login, enter:

```
acs_tail $ACS_HOME/acsss_event.log
```

You can view the event log in a text editor, for example:

```
view acsss_event.log
```

Managing the Event Log

You use the `acsss_config` configuration program to specify the following:

- Event log size and number of rollover files

- Pathname of the directory that contains the event log

- Event log date/time format

- Whether the event log logs cartridge enters in automatic enter mode

- Whether the event log logs database volume additions and deletions

For more information, see "Chapter 6. "Verifying and Changing Dynamic and Static Variables, Option 2 – Set event logging variables".

Event Log Errors

The following are errors that may occur as part of event log processing.

- If a communication failure occurs while the event logger is sending a message to `cmd_proc`, the unsolicited message is lost.

- The following unsolicited message is displayed if the event logger is unable to access or write to the event log file. This may be due to incorrect permissions on the directory or the file.

```
Event log access failed
```

Using greplog to Search Event Logs

greplog does intelligent ACSLS Event Log searches. When greplog finds a match, it returns all lines of the Event Log message, not just the line containing the string that was matched. This lets you see the message's date and time stamp, message number and the function text. Because a greplog search provides the full context of the message, it facilitates research into ACSLS events.

Format

The format for searching the Event Log using greplog is as follows:

greplog [-iv] pattern file_1 file_2 ... file_n

Options

-i

tells greplog to ignore the case of the search pattern expression.

-v

specifies that greplog displays all of the entries in the log file except those entries which match the pattern expression.

pattern:
specifies the search pattern expression

file_1 file_2 ... file_n
greplog accepts multiple file parameters and wild card expressions in the file list.

Usage

greplog can be used to search for a pattern within the acsss_event.log. For each hit, it returns the entire Event Log entry containing the search pattern expression, not simply the single line containing the word. For example, a typical message contains the following information:

mm–dd–yy hh:mm:ss component_name [nn]:
message_number classification mod_id mod_ver mod_line
function: One or more lines of text

After retrieving matching messages with `greplog`, use the date and time in the message(s) to view that time period in the full event log and see the context for the event.

Examples   To search the Event Log for all occurrences of message number 1392:

`greplog 1392 acsss_event.log`

To search the Event Log for all messages about volume CART89:

`greplog CART89 acsss_event.log`

To search all archived copies of the Event Log for messages about tape mounts:

`greplog -i mount event*.log`

Note   The archived copies of the Event Log are named event1.log, event2.log, etc. event*.log searches all of them.

Logs of ACSLS Installation and Utilities

The $ACS_HOME/log (/export/home/ACSSS/log) directory, which contains the ACSLS event log, also contains logs from the ACSLS installation and for each of the ACSLS utilities. The contents of these logs are summarized in the entries for /export/home/ACSSS/log in Table 2. on page 21.

Entries are appended to these logs whenever you run the corresponding utility or script.

Hint: The utility logs do not have the same file sizing and rollover options that you can use to automatically manage and ACSLS event log. However, monitor.sh in $ACS_HOME/diag/bin can be used to monitor and automatically archive any log. For information on monitor.sh, see README.txt in $ACS_HOME/diag/bin.

The acsss_config.log is a report of library hardware configured by the acsss_config program. StorageTek recommends that you retain this log, which provides a useful record of your library hardware.

The bdb_event.log, export_event.log, import_event.log, install.log, rdb_event.log, sd_event.log, and volrpt.log record success and failure entries each time you run the corresponding script or utility. These logs are most useful, therefore, right after you run the utility. Especially if the utility failed, review its log, correct any errors, and rerun the utility until it runs successfully. After the utility runs successfully, you may want to delete its log to free disk space and to ensure that when you next run the utility, the log is recreated and contains only current entries. If you cannot successfully run the utility, however, save the log, which can help StorageTek resolve the problem.

The cron_event.log records events for the cron job that periodically runs the full_disk.sh script. The full_disk.sh.log records events for the full_disk.sh script, which does the following:

- Logs warning messages in the ACSLS event log if the ACSLS home directory ($ACS_HOME/acsss, usually /export/home/ACSSS) exceeds 85% full

- Backs up the ACSLS database as described in Chapter 11, *Database Backup and Restore*, "Automatic Database Backup."

Because the cron_event.log and the full_disk.sh.log record periodic events, you should *not* remove these logs. To conserve disk space, however, you may want to periodically edit these files to remove older, less meaningful entries.

Troubleshooting Library Connections

➡ **To troubleshoot Library Connections use the ACSLS tools appropriate for your platform.**

StorageTek has provided a set of tools to verify the connection between the ACSLS server and the attached LMU or LSMs. This section is laid out in two parts. The first part describes various ACSLS and OS diagnostic utilities that can be used to test and verify hardware connections to the library. The second part offers a troubleshooting strategy to use in the event of problems with library communication.

Part 1: ACSLS and OS Diagnostic Utilities

testports

This utility tests all of the library connections that have been defined in the ACSLS database. Port connections are defined using the `acsss_config` utility See "Chapter 7 Configuring Your Library Configuration". If you have not yet defined library communications with `acsss_config`, you must use `testlmu` or `probe-scsi.sh` (see below) to test each individual library connection. Since `testports` actually communicates through the same port defined in ACSLS, the `testports` utility will not work while ACSLS is running.

For each library that is defined, `testports` will send a test packet to the library and then wait for an appropriate response from the library. In the response, the library reveals either its model number and microcode level or its compatibility code level. If the connection is good, `testports` will display the port name that is used in the connection and the model and/or code confirmation that was returned from the library.

Example

```
$ testports
/dev/mchanger0 is communicating to an LSM: STK L180 level
0221

/dev/ttyb is communicating to an LMU at compat level 13
```

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A positive response to `testports` verifies the device driver and the essential hardware path to each library.

testlmu   This utility will send a test packet from the ACSLS server to a serial–attached or a network–attached LMU and will verify the response. If the connection is good, the LMU will respond with its code compatibility level. Since `testlmu` uses the ACSLS port to communicate to the LMU, the port must be offline to ACSLS. If ACSLS is holding the port online, you will get a false indication of failure with `testlmu`.

You must pass the appropriate port name as an argument to `testlmu`.

Example   `$ testlmu /dev/ttyb`
`LMU Responded, compat level 12`

A positive response verifies the device node and the essential hardware path to the library.

probescsi.sh   This utility will send a SCSI `inquiry` test packet to a SCSI–attached LSM and verify the response. If the communication is good, the LSM will send a return packet revealing the make, model number and microcode level of the LSM. Since it communicates directly with the LSM, this routine cannot be used while ACSLS is running.

You must pass the appropriate port name as an argument to `probescsi.sh`.

Example   `$ probescsi.sh /dev/mchanger0`

`/dev/mchanger0 is communicating to an LSM: STK L180 level 0221`

A positive response verifies the device driver and the essential hardware path to each library.

| ck_port_node.sh | This utility is valid only for Solaris systems. It extracts a long listing of the port node for all defined ports in ACSLS. It reveals port permissions, port ownership and the hardware device path to the port. The hardware path reveals the communication path from the most internal bus to the unique controller, to the most external connection on the box itself. All ACSLS ports are character devices that are owned by root and available to all users (rw–rw–rw–). |

| Example | `$ ck_port_node.sh` |

```
 crw-rw-rw- 1 root sys 165, 1 May 31 15:35
/dev/../devices/pci@1f,0/pci@1/scsi@3/mchanger@6,0:
character

crw-rw-rw- 1 root sys 20, 1 Jun 7 15:35
/dev/../devices/pci@1f,0/pci@1,1/ebus@1/se@14,400000:b
```

In the case of the mchanger device, the target ID of the library is the number 6 in mchanger@6.

In the case of the serial device, the specific port is the last character in the listing (port b).

System Utilities: AIX

| lsdev | On AIX systems, you can identify the hardware device path using *lsdev.* The hardware path reveals the communication path from the internal pci bus to the most external connection on the system. |

| Example (serial) | `$ lsdev -C -c tty`
`tty0 Available 01-C0-00-00 Asynchronous`
`Terminal` |

In this example, the unique port identifier was "C0"

| Example (SCSI) | `$ lsdev -C -s scsi`
`mchanger0 Available 04-05-00-6,0 Other`
`SCSI Tape Drive` |

In this example, the unique SCSI controller in this path was identified as "05". The SCSI device in this example resides at target–6, logical unit–0.

diag This utility bypasses all software drivers and sends a very simple `inquiry` command directly from AIX to the library. A valid response will reveal that the hardware connection is good and that the library can communicate.

To use `diag` in order to verify the hardware path to the library here is the process:

1. Become `root` user with `login` or `su.`

2. Enter the command:

   diag

3. At the first screen, which is informational, press [[ENTER]].

4. At the 'Function Selection' screen, scroll down until the "Task Selection()" option is highlighted.

   Press [[ENTER]].

5. In the 'Task Selection List', scroll down until "SCSI Bus Analyzer" is highlighted.

   Press [[ENTER]].

6. In the 'Resource Selection List', identify which SCSI I/O controller is used for your STK library.
   If you are not sure which controller to specify, use
   lsdev -C -s scsi
   as described above.

7. Highlight the appropriate controller.

   Press [[F7]] to commit that device for this test.

8. The first 'SCSI Bus Exerciser' screen is informational.

   Press [[ENTER]].

9. In the second 'SCSI Bus Exerciser' screen, press the **tab** key to select the target address that is assigned to the STK library. If you are not sure which target to specify, consult

the configuration option in the operator panel on your library. Alternatively, you can use the AIX command
`lsdev -C -s scsi`
as described above.

10. When the correct target ID has been selected, press ⟦F7⟧ to commit the test.

11. In the third 'SCSI Bus Exerciser' screen, the system will ask you to confirm the test to send a SCSI `inquiry` command across the bus to the library.

    Press ⟦ENTER⟧ to confirm the test.

12. The library should respond with its make and model. The ASCII character response will be displayed in its hexadecimal form.
    To determine whether the test was successful, look for the character string "53 54 4B" (STK).

Example The following Inquiry data was returned:

08 80 02 02 33 00 00 00   **53 54 4B** 20 20 20 20 20

4C 31 38 30 20 20 20 20   20 20 20 20 20 20 20 20

31 31 30 30 20 20 20 20   20 20 20 20 20 20 20 20

20 20 20 20 20 20 20 20   00 00 00 00 00 00 00 00

The ASCII characters (in boldface) translate "STK L180"

**System Utilities:
Solaris**

probe–scsi–all   This utility actually runs beneath Solaris at the PROM monitor level. This low–level utility bypasses all software drivers and sends a simple 'inquiry' command directly to the library. A valid response will display the make, model and code level of the library. This reveals whether the hardware connection is good and the library can communicate.

On Sun Ultra systems, it is necessary to abort UNIX and also reset the system before running `probe-scsi-all`. Use the following procedure:

1. Become `root` user with:
    `login` or **`su`**.

2. Halt the system with:
    `init 0`

3. At the "ok" prompt, enter the command:
    `reset-all`
    The screen will go blank for a few seconds.

4. When the system begins to boot, interrupt the boot sequence with:
    `Stop-A` (Press the Stop key together with the letter A.)

5. At the "ok" prompt, enter:
    `probe-scsi-all`

Example   ok **probe-scsi-all**
                 This command may hang the system if Stop-A or the halt
                 command has been executed.
                 Please type reset-all to reset the system before
                 executing this command.
                 Do you wish to continue? (y/n) **y**
                 /pci@1f/pci@1/scsi@3,1

                 /pci@1f/pci@1/scsi@3
                 Target 6 Unit 0 Removable Device type 8 STK L180 0221

In this example, the system found two SCSI controllers. The first controller, SCSI@3,1, had nothing connected. The second one, SCSI@3, was connected to a device at target–6. That device was a StorageTek L–180 library running microcode version 0221.

**Part 2:
Strategies for
Troubleshooting
Host–Library
Communication
Problems**

There are numerous possibilities that might account for communication problems between ACSLS and the library. The root cause may be related to hardware problems, software problems, driver problems, or device node settings. This section is intended to help you isolate the various possibilities down to one or more causes.

Troubleshooting a
Serial Connection

To verify the serial hardware connection, you can use either of two utilities. If the serial port has already been defined in ACSLS then you can use the command testports. Otherwise, use testlmu, passing the desired port_name as an argument. If the test response is positive, then you have verified a good hardware connection. If the response is negative, then you should consider each of these possibilities:

1. Verify a valid port definition.

    Make sure that the port you specified (or the port that was defined in acsss_config) is the correct port name. You should identify the physical connector on the machine that maps to that particular port address, and then make sure that the LMU cable is connected to that specific port.

2. Verify a valid port node.

    On a Solaris machine, run the ACSLS utility
    `ck_port_node.sh`. If the port name has not been defined
    in `acsss_config` then you will need to pass the port name
    as an argument. This utility will return a listing of the
    low–level port node for the specified port. From the
    listing, you should verify the following:

    a. The leading character in the listing should be the
       letter "c", indicating that the port is a character
       device. If there is any other letter in this position,
       then the port name that was specified is an invalid
       port name.

    b. The permissions for read and write should be open to
       everyone (rw–rw–rw–). This is the default
       configuration for ports on a Solaris machine. If the
       permissions do not allow for public read and write
       access, then you should change the permissions.

       o   Login or switch user to `root`.

       o   Then use `chmod 666 <path_name>`,
           specifying the complete path that was
           displayed in the `ck_port_node.sh` listing.

    If you find that the permissions are not wide open,
    then the port is likely to be under the control of the
    Solaris `port monitor`. This is apt to cause problems
    again. You should completely disable the LMU port
    from the port monitor using the system `admintool`
    utility.
    As `root` user, run `admintool` from the system
    console. Choose 'browse' and then 'serial ports'.
    Select the LMU port.

Disable the LMU port from the port monitor by clicking on the 'service enable' button.

An alternate method to disable the LMU port from the port monitor is to remove the LMU port record from the file:

`/etc/saf/zsmon/_pmtab`

On an AIX machine, run the utility `lsdev -C -c tty` to verify that the specified port is available. If it is not available, then you should use the `smitty` utility to create a new instance of a TTY or change one that has already been defined. Choose 'devices', then 'TTY', then either 'Add a TTY' or 'Change / Show characteristics of a TTY'.

3. Verify that the cable connection is good.

   The LMU supports hardware handshaking. In order to assure 100% compatibility between the host and LMU, you will want to verify the following pin connections. (The following assumes a standard DTE pin arrangement for the host.)

```
For DB-25 to DB-25 connectors:
Host                                  9330 LMU
   2  ------------------------------ 2
   3  ------------------------------ 3
   4  ------------------------------ 4
   5  ------------------------------ 5
   6  ------------------------------ 6
   7  ------------------------------ 7
   8  ------------------------------ 8
  20  ------------------------------ 20
```

```
For DB-9 to DB-25 connectors:
                                        9300
Host                                    LMU
  1   -----------------------------  8
  2   -----------------------------  3
  3   -----------------------------  2
  5   -----------------------------  7
  6   -----------------------------  6
  7   -----------------------------  4
  8   -----------------------------  5

For DB-25 to DB-9 connectors:
                                        9740
Host                                    LMU
  8   -----------------------------  1
  3   -----------------------------  2
 20   -----------------------------  4
  2   -----------------------------  3
  7   -----------------------------  5
  6   -----------------------------  6
  4   -----------------------------  7
  5   -----------------------------  8

For DB-9 to DB-9 connectors:
                                        9740
Host                                    LMU
  1   -----------------------------  1
  2   -----------------------------  2
  3   -----------------------------  3
  4   -----------------------------  4
  5   -----------------------------  5
  6   -----------------------------  6
  7   -----------------------------  7
  7   -----------------------------  8
```

4. Verify that the LMU is powered up and functional.

    Since `testports` and `testlmu` rely on a valid response
    from the LMU, these tests assume that the LMU is
    functional. In some cases an incomplete host–LMU
    transaction can cause the LMU to stop communicating. In

such an event, you can IPL the LMU to in order to restore communication.

Troubleshooting a SCSI Connection

To verify the SCSI hardware connection, you can use either of two utilities. If the SCSI port has already been defined to ACSLS then you can use the command `testports`. Otherwise, use `probescsi.sh`, passing the desired port name as an argument. If the test response is positive, then you have verified a good hardware and software connection. If the response is negative, then you should consider each of these possibilities:

1. Verify a valid port definition.

   Make sure that the port you have specified is `/dev/mchangerX`. On Solaris machines, the X is the target ID of the library device on the SCSI bus. On AIX systems, X is an incremental number, starting with 0 and incrementing with each new mchanger device that is defined.

2. Verify a good hardware connection.

   On Solaris use *probe–scsi–all*. For AIX, use *diag.* A positive response verifies a good cable connection and all of the hardware between the host and the library.

   If the response is negative, check each of the following:

   •**Check the cable.** Look closely at the connectors for any bent pins. Make sure the connectors are securely attached to the equipment at each end of the cable.

   •**Check for bus compatibility and proper termination.** A single–ended SCSI bus should be populated only by single–ended devices and a single–ended terminator. A differential SCSI bus should be populated only by differential devices and a differential terminator. You should be able to determine the type of host–bus adapter card installed in your system. Make sure that the library device is compatible with the adapter and that it is properly terminated.

•**Check the library device.** The library must be powered on and functional in order to respond to a SCSI inquiry from `diag` or `probe-scsi-all`.

3. Verify a valid device node.

On a Solaris Machine:

Run `ck_port_node.sh`. Make sure that the listing is a character device (the first character in the listing should be the letter "c"). Make sure that the device path reveals a SCSI connection to the Library and that the target ID in the listing matches the target defined in the operator panel of the library. Also, make sure that the permissions are set for read and write access to all users (`rw-rw-rw-`).

If an mchanger device does not exist, then you can create one as `root` user, using:

`$ACS_HOME/install/install_scsi_sol.sh`

If an mchanger device exists, but you suspect that it may have been improperly created, you can remove it and rebuild it. To remove the mchanger device, switch user to *root* and use the following command:

`rem_drv mchanger`

You will need to reboot the system in order for the mchanger driver to be unlinked from the kernel.

Now rebuild the mchanger device. Make sure that the library is powered on and functional, and then run:

`$ACS_HOME/install/install_scsi_sol.sh`

In most cases, `$ACS_HOME` is defined as `/export/home/ACSSS`. You will need to be `root` to use this command.

On an AIX System:

Run lsdev -C -s scsi. Make sure that an mchanger device is available and that it matches the target ID of the library device.

If a matching mchanger device does not exist, then you can create one as root user, using:

$ACS_HOME/install/install_scsi_aix.sh

In most cases, $ACS_HOME is defined as /export/home/ACSSS. You will need to be *root* to use this command.

If an mchanger device exists, but you suspect that it may have been improperly created, you can remove it and rebuild it. To remove the mchanger device, switch user to *root* and use the following command:

rmdev -l mchangerX -d

where X is the specific instance of the mchanger you want to remove.

Now rebuild the mchanger device node with the command*:*

$ACS_HOME/install/install_scsi_aix.sh

In most cases, $ACS_HOME is defined as /export/home/ACSSS. You will need to be root to use this command.

Recovering Errant (Lost) Volumes

A hardware or software error during a motion request for a volume can cause the request to fail and produce an "errant volume" condition where ACSLS marks the volume absent or deletes the volume information from the database. For example, if a transport stops communicating with the LCU and a client issues a dismount for a volume in the transport, ACSLS may not be able to recover, and may delete the volume information from the database.

ACSLS uses the file:
$ACS_HOME/data/internal/acserrv_rc.dat (usually /export/home/ACSSS/data/internal/acserrv_rc.dat) for errant volume recovery. This file lists all error conditions that invoke Errant Volume Recovery.

If an errant volume condition occurs, ACSLS logs message 0 in the event log with text that describes the error such as the following:

```
2002-06-24 16:48:27 ERRV[0]:
0 I acserrv.c 1 1216
    Error response on MOUNT:
    LMU error message: "Drive - drive already has a cartridge loaded"
    ACS Id: 0; LSM Id: 00
    no cartridge movement ever started

    Request was:
    Mount; verify media type and VOLSER; normal operation
    media type: 1; VOLSER: U01243; ACS Id: 0
    source: LSM 00; normal cell at panel 02 row 04 column 05
    destination: LSM 00; drive at panel 03 drive 03
```

ACSLS tries to recover the errant volume. If successful, ACSLS logs a subsequent message 0 in the event log with text such as the following:

```
999-08-24 16:49:05 ERRV[0]:
0 I errvol.c 1 670
    VOLUME "U01243" IS IN DATABASE.
```

If the recovery fails, ACSLS logs a message 0 in the event log with text such as the following:

```
1999-08-24 16:49:10 ERRV[0]:
0 I errvol.c 1 670
    MANUAL INTERVENTION MAY BE REQUIRED:
    THE FOLLOWING "cmd_proc" RECOVERY ATTEMPT(S) FAILED:
    dismount U01243 0,0,3,3 force
    audit 0,0,0 subpanel 0,0,2,4,5,4,5
```

Cartridge Recovery will also try to recover the volume by examining all recorded locations for the volume. If Cartridge Recovery finds the volume it makes the volume active.

When Cartridge Recovery is unable to find the volume and it may be stuck in a drive, use the volume and drive information (volume U01234 and transport 0,0,3,3 in this example) to physically locate the errant volume, remove it from the LSM, and reenter it into the LSM to restore it to the ACSLS database. If the volume still exists in the database and is not marked absent or missing, you must use the del_vol utility either to mark the volume absent or to delete it before before entering it into another LSM.

You can customize the file $ACS_HOME/bin/notify_oper.sh (usually /export/home/ACSSS/bin/notify_oper.sh) to provide notification of errant volumes by pager, e–mail, and so forth, if recovery fails. The file contains customization information.

Notes   If absent cartridge support is enabled (the absent volume
retention period is non–zero), cartridges that cannot be found are
marked absent and are not deleted from the ACSLS database.
When an absent cartridge is found, it is reactivated, and the
information about the volume is preserved.   See "Chapter 10,
Cartridge Management, Using the Absent Cartridge Support
Feature" for more information.

Use `greplog` to search the ACSLs event log for all messages
referring to a lost volume. See "Using `greplog` to Search Event
Logs" above.

Gathering ACSLS Diagnostic Information

Use the data gathering tool to collect complete ACSLS
diagnostic information for StorageTek Software Support.

- Login as `root`

- Change to the `diag/bin/` directory

  cd $ACS_HOME/diag/bin

- Gather diagnostic information

  ./get_data.sh

- This creates a file containing a collection of diagnostic
  information: $ACS_HOME/log/output.tar.Z

- After you contact StorageTek Software Support about your
  issue, please send them the
  $ACS_HOME/log/output.tar.Z file.

Appendix C. IPC Surrogate Library Management Gateway

Overview

This appendix provides instructions for activiating and configuring the IPC Surrogate code within ACSLS. This code is only used with the StorageTek Library Management Gateway product and should only be activated if you are installing that product.

The IPC surrogate is a persistent process (acssurr) that listens on a specified socket for ACSAPI binary requests sent by the gateway component of the Library Management Gateway product. The gateway, a separate product that is located inside the network firewall, receives requests from romote client systems on a designated port. The IPC Surrogate must be activated on each ACSLS Library Management Server that is expected to receive client requests through the gateway.

How the IPC Surrogate Works

The IPC Surrogate maintains a queue of multiple simultaneous open socket connections between itself and the gateway. There is one socket connection for each ACSLS request from the gateway. The IPC Surrogate receives the binary request from the gateway and passes it to the Library Manager (LM) component of ACSLS for processing. The IPC Surrogate then receives binary response information from the LM and sends it back to the gateway. Each socket connection is closed after sending the final response to the request back to the gateway.

Activating the IPC Surrogate

The IPC Surrogate is deactivated by default. You can activate the feature with the SURROGATE_PROCESSES variable under the acsss_config main menu item #1, *Set CSI Tuning Variables*.

Key: SURROGATE_PROCESSES

Default: 0

Range: 0–1

Prompt: Number of acssurr processes that should be started

Description: This parameter specifies how many persistent acssurr processes should be started when ACSLS starts. Currently only one acssurr process is allowed. so this parameter effectively turns the IPC Surrogate on (1) or off (0). ACSLS must be restarted for changes to take effect.

Configuring the IPC Surrogate

Configuration variables for the IPC Surrogate are in the acsss_config main menu item #1, *Set CSI Tuning Variables*. ACSLS must be restarted for changes to take effect.

Note: You should not need to change these defaults under normal circumstances.

Define the Server Port to Listen On

Key: SURROGATE_PORT

Default: 50300

Range: 50300–99999

Prompt: TCP/IP port number that the ACSLS surrogate (acssurr) socket will listen on for requests from a gateway system

Description: This parameter specifies the agreed upon port number that both the gateway and Surrogate will communicate on. 50300 is the default on both. However, the range of numbers above 50300 can safely be used and will not conflict with other assigned port numbers used by other processes within ACSLS.

Note: If a port other than 50300 is specified, the gateway must also be configured to use that same port number. If 50300 is specified here, no further configuration is required on the gateway since it is expecting to send packets to port 50300 on the server by default.

Set the Surrogate Timeout Value

Key: SURROGATE_TIMEOUT

Default: 10

Range: 1–600

Prompt: Number of seconds to wait for data packets to be read on surrogate/gateway socket

Description: This parameter specifies the maximum number of seconds that the Surrogate should allow to read the data packets from the gateway. You should only modify this value if timing problems occur between the Surrogate and gateway. Increasing this value may alleviate wrong length packet errors (noted in the event log) that can happen when the expected amount of data to be read on the socket is not received within the timeout.

Set the Wait Time for Deleting Queue Entries

Key: SURROGATE_QUEUE_AGE

Default: 5

Range: 1–20

Prompt: Number of minutes to wait before deleting a stale queue entry

---

Description: The IPC Surrogate process (acssurr) listens on a TCP/IP socket for ACS requests from a gateway that sits behind a network firewall. The docket id associated with each request is stored on a queue along with the current time. As ACK and INTERMEDIATE responses are sent back to the gateway, the time field is reset. If a queue entry is not accessed within the number of minutes indicated by this variable, then it is assumed the connnection between the gateway is lost and the queue entry is considered stale. The socket is then shut down and closed. The queue entry is removed from the queue and the program continues.

Confirming that the IPC Surrogate Is Running

When activated, the IPC Surrogate is started as one of the persistent processes when ACSLS starts. A message is logged to the acsss_event.log file to display the Process ID (PID) and the TCP port where requests are being accepted from the gateway:

```
surr_main (PID 14034): Surrogate now accepting
requests on port 50300
```

You can "ping" the Surrogate to see if it is alive and get it to generate the above message again by sending a "usr1" signal to the Process ID:

```
psacs | grep acssurr
```
(to find the Surrogate Process ID)

```
kill -usr1 14034
```
(look in acsss_event .log for message)

Message Logging

IPC Surrogate messages are logged to the acsss_event.log file on the ACSLS server.

Appendix D. Installing AIX from a Backup

The AIX operating system can be installed from a system
backup tape created using `smitty mksysb`.

Installing AIX from a System Backup

To install AIX from a system backup:

1. **Make sure that the tape drive is turned `ON`.**

2. **Make sure that the server is turned `ON`.**

3. **Open the tape drive door.**

4. **Turn the key to `Service`.**

5. **Insert the AIX Operating System backup tape into the
   tape drive. Close the tape drive door.**

6. **On the server, press the `Reset` button twice.**

7. **If the `TESTING COMPLETED` screen displays, press
   ⟦Enter⟧ to continue.**

   Note: For a few minutes the system might appear idle.
   Do not open the tape drive door. Wait for the next screen
   to display.

8. **The following message displays:**

   `Please define the System Console.`

   Press ⟦F1⟧ to define the system console and then press
   ⟦Enter⟧.

   The `INSTALLATION AND MAINTENANCE` screen appears.

9. **Select `Install a system that was created with
   SMIT "Backup The System" function or the`**

"mksysb" command. **Press [[Enter]] to install the operating system from the backup tape.**

The CURRENT SYSTEM SETTINGS screen displays.

10. **Verify that the system settings are correct. If the correct settings are displayed, select** Install a SMIT "Backup The System" image with the current settings. **Press [[Enter]].**

The FINAL WARNING screen displays.

11. **Select** Continue with installation. **Press [[Enter]].**

12. **Press [[Enter]] to start the tape.**

The installation takes 45 minutes to 1.5 hours.

13. **Turn the key to** Normal *before* **the installation completes.**

When the installation is complete, a screen displays indicating that the AIX Base Operating System installation is complete.

14. **Remove the AIX Operating System backup tape from the tape drive.**

15. **Press [[Enter]] to reboot the server.**

16. **During rebooting ignore the following error messages:**

The System Resource Controller daemon is not active.
Machine not identical to previous configuration.
Shutdown, rebooting.

Note: If the system used to create the backup tape is not the same as the system on which it is now being installed, the server might reboot two or three times.

Each time the server reboots, the system reconfigures. When the server reboots successfully, a login prompt displays.

Appendix E. CSCI Installation

This chapter describes the Client Server Communications Interface (CSCI) component and shows you how to install CSCI.

Installation of CSCI should follow installation of the operating system and installation and configuration of ACSLS.

This chapter covers the following topics:

- Overview of CSCI

- Installing SNA Server 6.1

- Installing Token Ring adapter

- Configuring SNA Server 6.1

- Error messages

- Related CSCI information

Overview of CSCI

The Client Server Communications Interface (CSCI) is a stand-alone component responsible for the passing of request and response packets between a client system and a server system. CSCI is an optional component that lets MVS or RMLS/CSC clients communicate with ACSLS. If you do not use CSCI, you use CSI by default to communicate with ACSLS.

CSCI Connectivity

CSCI provides IPC and SNA connectivity to link the following:

ACSLS server   ⇔   MVS clients or
                                     RMLS/CSC clients

Architecture and Subsystems

Figure 54 depicts an overall CSCI architecture and subsystems.
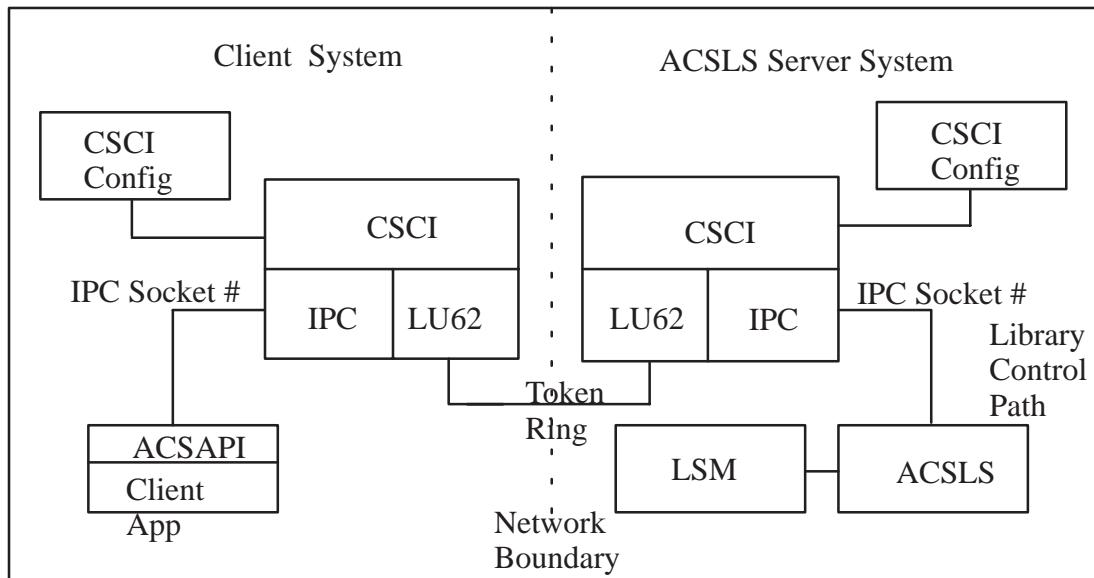
Figure 54. CSCI Architecture and Subsystems

Figure 55 shows how the CSCI system connects with the Token
Ring interface. On the server side, the data flows from the
Token Ring through the LU6.2 interface to the CSCI interface.
From here the data flows through an IPC interface to the ACSLS
software in both directions but in a half duplex mode, i.e., one
direction at a time.
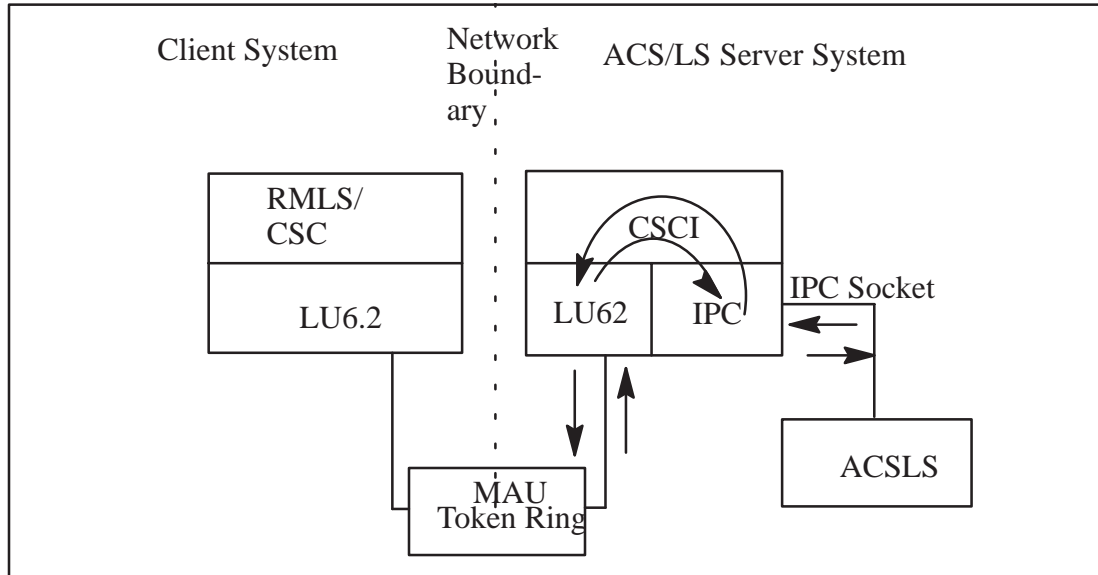
Figure 55. CSCI System with Token Ring Interface

Installing the SNA Server 6.1

If installing SNA 6.1 IBM Communications Server for AIX, we recommend that you do not export and import the profiles, but follow the procedures for configuring SNA 6.1.

To install SNA, see the Communications Server product notes which describe the procedure for installing SNA.

Upgrade Installation   If you upgraded from a previous release of SNA, check for files /etc/sna/sna_node.cfg and sna_tps. If they exist after the upgrade, delete these files. (They will be re-created after configuring SNA 6.1)

⇨   **To delete these files:**

1. Log in as root.

2. Issue the following commands:

   cd /etc/sna

   rm sna_node.cfg

   rm sna_tps

3. Continue with the SNA 6.1 configuration.

Installing the Token Ring Adapter

➡ **To install the Token Ring adapter:**

1. Log in at the console prompt as `root`.

2. Add Token Ring Data Link Control by entering

   `smitty cmddlc_token`

   The `Data Link Controls` screen appears.

3. Select `Add a Token Ring Data Link Control` and press ⟦ENTER⟧.

   The `Name of Device to Add` pop-up box appears.

4. Press ⟦ENTER⟧ to accept the `dlc Token-Ring Data Link Control` default.

   This selection creates the Token Ring.

5. Press ⟦ENTER⟧ to run the command.

   The `Command Status` screen appears, and the system runs the command.

6. When the `Command: OK` message appears at the top of the `Command Status` screen, press ⟦F10⟧ to return to the prompt.

7. At the prompt, change Token Ring line speed by entering

   `smitty chgtok`

   The `Token Ring Adapter` screen appears.

8. Press ⟦ENTER⟧ to accept the default `tok0 Available 00-02 Token-Ring High-Performance Adapter`.

9. At the `Change/Show Characteristics of a Token-Ring Adapter` screen, press ⟦ENTER⟧.

   The Ring speed displays.

10. Enter the Token Ring line speed desired or leave it as it is.

    The Token Ring line speed is usually set to 16.

11. Press ⟦ENTER⟧ to run the command.

    The `Command Status` screen appears, and the system runs the command.

12. When the `Command: OK` message appears at the top of the `Command Status` screen, Press ⟦F10⟧ to return to the prompt.

Configuring SNA 6.1

After SNA is installed and the latest PTF installed, configure SNA via the `xsnaadmin` GUI tool

⇨ **To configure SNA:**

1. Enter the following commands:

   `xhost +`

   `su – root`

   `xsnaadmin&`

   The main window appears.

2. Click No in the popup window.

3. Select `Services` from the toolbar, then `Configure Node parameters` from the drop-down window.

   The `Node parameters` box appears.

4. Enter the following:

   For the `Control Point` name, enter the APPN (Network ID) in the first box, and the system name in the box to the right.

   For the system name, you may use one of the following:
   - ○ Your RS6000 system name
   - ○ CSCILU1
   - ○ The AS400 connection name

5. Click OK.

6. From the main window, select:
   - ○ `Services` from the toolbar
   - ○ `Connectivity` from the `Services` dropdown window
   - ○ `New Port` from the `Connectivity` dropdown window

Appendix E. CSCI Installation **615**

7. You should see the Token Ring card. If you don't, check that you have correctly installed the Token Ring card, installed all AIX drivers, and installed all Token Ring SNA files.

8. Click OK.

   The `Token ring SAP` box appears.

9. Accept the defaults and click OK.

10. From the main window, select the following:

    ○ `Services` from the toolbar

    ○ `APPC` from the `Services` dropdown menu

    ○ `Transaction Programs` from the APPC dropdown menu.

    The `Mode` box appears.

11. In the `Name` field, enter CSCIMODE and accept the defaults.

12. Click OK.

13. From the main window, select the following:

    ○ `Services` from the toolbar

    ○ `APPC` from the Services dropdown menu

    ○ `Transaction Programs` from the APPC dropdown menu.

14. Click New.

    The `TP invocation` box appears.

15. Enter the following information:

    Application TP: **csciServer.sh**

    Click the `Queue Incoming Allocation` checkbox.

    Click the `TP uses CS/AIX V4 APIs` checkbox.

Full path to TP executable:
/export/home/ACSSS/bin/csciServer.sh

User ID: **acsss**

Group ID: **staff**

16. Click OK.

17. Exit the xsnaadmin GUI application.

18. Stop and start SNA:

    sna stop

    sna start

19. Launch xsnaadmin.

20. Click Start.

    The node and port should now be active and AS400 clients can now send requests. The AIX machine will dynamically create the LU and the sessions.

**Enabling Auto
Startup at Reboot**

⇨ **To start SNA Server 6.1 automatically when you
reboot:**

1. Log in as UID=0

2. Open the /etc/rc.sna file with a text editor.

3. Uncomment the line snaadmin init_node.

4. Save the changes.

    At the next system reboot, SNA Server 6.1 starts
    automatically.

    Note: After installing ACSLS, you need to set up a cron
    job to delete any CSCI files in the /tmp directory. For
    instructions about this setup, see the snacron.sh file in
    export/home/ACSSS/install.

Error Messages

CSCI installation and configuration error messages relate to the following conditions:

- Improper ownership

- Improper access permission

- Undefined environment variables

- A variety of miscellaneous conditions

- Improper CSCI and LU6.2 configuration

Common Error Messages

```
Communication failure, verb = cmroutine, rc = xx, errno =  yyy IPC
            failure on Socket  CSCIzzzzz
```

Explanation: The read failed on the named connection.

Variable:

- *xx* is IBM CPI return code

- *yyy* is the UNIX errno value in /usr/include/sys/errno.h

- `CSCIzzzzz` is the socket number that was in use

- *cmroutine* is the IBM CPI routine name that failed

```
Read failed for connection: connection_name
```

Explanation: The read failed on the named connection.

Variable: `connection_name` is the name of the connection on which the read failed.

```
Write failed for connection: connection_name
```

> **Explanation:** The write failed on the named connection.
>
> **Variable:** *connection_name* is the name of the connection on which the write failed.

Related CSCI Information

For a visual representation of the Token Ring connections between the RS/6000 and the AS/400, see Appendix F.

For a discussion of CSCI environment variables and the `csciServer.sh` script, see Appendix G.

Appendix F. RS/6000 to AS/400 Connections

The following table contains a cross–reference between the connection definitions of the Token Ring installation options of the RS/6000 and those of the AS/400. For successful installation and configuration, the field names that are equated to each other should have the same information supplied.

In the following table, the letters after the RS/6000 field names (**A, B**, etc.) and the letters before the AS/400 field names (**A, B**, etc.) represent the information that should be specified for that field name. When the information is specified for an RS/6000 field name and an AS/400 field name, the letters are the same. For example, the name specified for the Control Point name for the Rs/6000 is the same name specified for the Remote Control Point in the AS/400.

RS/6000 SNA/XSNA Field Names	AS/400 Field Names
Initial Node Parameters	**Line Description**
Control Point Name **B**	**L** Line Description (LIND)
Local Network Name **A**	Line Speed (LINESPEED)
	I Local Adapter Address (ADAPTER)
	Source Service Access Point (SSAP)
Local Transaction Program	Auto create Controller
Profile Name	
Transaction Program Name **G**	**Controller Description**
	B Controller Description (CTLD)
	Online at IPL (ONLINE) *Yes
Mode	**L** Switched Line List
Mode Name (CSCIMODE) **K**	**A** Remote Network Identifier (RMTNETID)
	B Remote Control Point Name (RMTCPNAME)
	Initial Connection (INLCNN) *DIAL
	LAN Remote Adapter Address (ADPTADR)
	Device Description
	B Device Description (DEVD)
	B Remote Location Name
	Online IPL (ONLINE) (YES)
	O Local Location (LCLLOCNAME)
	A Remote Network Identifier (RMTNETID)
	B Attached Controller (CTL)
	E Single Session Capable (No)
	Mode
	K Mode (Mode)
RS/6000 to AS/400 Connections Cont'd.	
	AS/400 Field Names Cont'd.

Communication Slide Information

Side Information

B Remote Location

G Transaction Program

B Device

O Local Location

K Mode

A Remote Network Identifier

RMLS Configuration

* Server

B Remote LU Name

AS/400 Token Ring Field Definitions

The following table contains the fields on the AS/400 that are used for Token Ring connections.

AS400 Field Names	Content Information
Communication Side Information	**WRKCSI**
Remote Location	Control Point name from Node Parameters screen in xsnaadmin
Transaction Program	"csciServer.sh"
Device	*LOC
Local Location	*LOC
Mode	"CSCIMODE"
Remote Network Identifier	Local network Name from Node parameters set-up on RS/6000 in xsnaadmin
Controller Description	**CRTCTLAPPC**
Controller Description–CTLD	Name of the Controller. Should be named the same as the Control Point name in Node parameters in xsnaadmin.
Online at IPL – ONLINE	"YES"
Switched Line List – SWTLINST	The name of the Token Ring from the AS/400 Line description – LIND field
Remote Network Identifier – RMTNETID	The name of the Network ID from RS/6000 xsnaadmin node parameters
Initial Connection – INLCNN	"Dial"
Lan Remote Adapter Address – ADPTADR	"lscfg –l tok0 –v" is the RS/6000 SNA Token Ring Mac Address
Device Description	**CRTDEVAPPC**
Device Description – DEVD	Name of the Device. Should be named the same as the Control Point name on the RS/6000
Remote Location Name – RMTLOCNAME	Control Point name on RS/6000
Online at IPL – ONLINE	"YES"
Local Location – LCLLOCNAME	Default location name *NETATR
Remote Network Identifier – RMTNETID	The same as the NEtwork Name on the RS/6000 xsnaadmin node parameter
Attached Controller – CTL	The same as the AS/400 Controller Description that is attached to the Token Ring

Single Session – LIND	"NO"
Mode – MODE	*NETATR – The same as the AS/400 Network Attributes default Mode
Line Description	**CRTLINTRN**
Line Description – LIND	Name of the Token_Ring. The same as the AS/400 Controller Description Switched line Line List
Line Speed – LINESPEED	Must be the same as the Adapter speed of the RS/6000
Local Adapter Address – ADAPTER	Address of the AS/400 Token Ring Adapter
Source Service Access point – SSAP	Must be divisible by 4
RMLS Configuration	**WRKRMLCFGD**
*Server	
Remote LU Name	Same as the RS/6000 Control Point name in xsnaadmin Node Parameters screen

Appendix G. CSCI Environment Variables

CSCI is invoked by `csciServer.sh`, a Transaction Program Name (TPN) in the directory where ACSLS executables reside. This shell script defines CSCI environment variables.

Table 34. shows descriptions of CSCI environment variables for the server subsystem. Following this table is a shell script like the one provided in the distribution of ACSLS/CSCI software. This shell script is started by SNA on the server.

Table 34. CSCI Server Subsystem Environment Variables	
Name	**Description**
CSCI_TRACE	This variable is used to indicate whether CSCI tracing is **ON** or **OFF**.
CSCI_SLEEP_TIME	This variable is used to indicate the PER sleep time at the end of each round–robin loop through the connection table (polling timeout). Default is **100 msec**.
CSCI_INITIAL_CONNECTION	This variable is used to indicate the CSCI's initial connect name to open first. This is the connection service name requiring i/o on initial startup of the CSCI. Clients usually open IPC first; Servers open LU6.2 first.
CSCI_SERVER_NAME	This variable is used to indicate the name of the CSCI Server. It must be set the same for all CSCI's Clients defined to a single CSCI server. **The server name must match its CSCI Clients CSCI_SERVER_NAME.** The matching of the Server and Client CSCI_SERVER_NAME provides an end–to–end logical link between machines. Finally, this name is used later for the "connectionname" in other environment variables.. The value assigned to the CSCI_SERVER_NAME must be replicated in the connectionname part of the subsequent variables.
CSCI_connectionname_NET_TYPE	This variable is used to indicate what Network type this CSCI is configured for from the CIF subsystem. The NETTYPE defines the transport layer used by this CSCI. Valid assignments are **LU62** or **IPC**.
CSCI_connectionname_INPUT_SOCKET	This variable is used to indicate the input socket number to use as input to this CSCI. This number would match the Server or Client application output socket number.
CSCI_connectionname_CON_TYPE	This variable is used to indicate this CSCI type. This CON_TYPE defines the CSCI to be either a **SERVER** or a **CLIENT**.
CSCI_connectionname_TRANSLATE_TYPE	This variable is used to indicate this CSCI XDR type to be employed during execution. This can be assigned to either **XDR** or **NONE**.

Table 34. CSCI Server Subsystem Environment Variables	
Name	**Description**
CSCI_connectionname_LU62_ADDRESS	This variable is used to indicate the SNA Symbolic Destination Name. This name is used by the client CSCI to connect to the Server CSCI. The CSCI Server will always have a NULL string assigned. The Client CSCI will always assign a SNA "Symbolic Name" into this variable. The Symbolic name is required for the SNA Network to connect two SNA networked connected CSCI's together. For further information regarding the SNA Symbolic Name, see *Side Information Table* in your SNA product manuals.
CSCI_connectionname_DESTINATION_SOCKET	This variable is used to indicate destination or output socket number to be used by the CSCI Server. This socket number would be the matching input socket number to the CSCI Server Application.

Shell Script Provided in ACSLS/CSCI Software:

#**Server 1**

```
#!/bin/ksh
#
# Start up the CSCI
#
# Setup environment variables
#
# trace
CSCI_TRACE=OFF
#CSCI_TRACE=ON
export CSCI_TRACE

# csci sleep time in milliseconds, default if omitted is 100
CSCI_SLEEP_TIME=100
export CSCI_SLEEP_TIME

# Initial connection
CSCI_INITIAL_CONNECTION=LU6CALL
export CSCI_INITIAL_CONNECTION

# Server name
CSCI_SERVER_NAME=SERVICE2
export CSCI_SERVER_NAME
```

```
#######################################
# Connection information for LU6CALL
#######################################
CSCI_LU6CALL_NET_TYPE=LU62
export CSCI_LU6CALL_NET_TYPE

CSCI_LU6CALL_TRANSLATE_TYPE=XDR
export CSCI_LU6CALL_TRANSLATE_TYPE
#
# the CSCI SERVER always has a null string for this variable.
#CSCI_LU6CALL_LU62_ADDRESS=""
export CSCI_LU6CALL_LU62_ADDRESS
#
#######################################
# Connection information for SERVICE2
#######################################
#
CSCI_SERVICE2_NET_TYPE=IPC
export CSCI_SERVICE2_NET_TYPE

#CSCI_SERVICE2_INPUT_SOCKET=######
CSCI_SERVICE2_INPUT_SOCKET=0
export CSCI_SERVICE2_INPUT_SOCKET

CSCI_SERVICE2_CON_TYPE=SERVER
export CSCI_SERVICE2_CON_TYPE

#CSCI_SERVICE2_DESTINATION_SOCKET=#####
CSCI_SERVICE2_DESTINATION_SOCKET=50003
export CSCI_SERVICE2_DESTINATION_SOCKET

#
# Start up the dummy parent and get its process id
#
/home/csci/bull/bin/csciParent &
curpid=$!
#
# Start the CSCI  executable with the following args:
#
#    arg1: process id of the dummy parent
```

```
#    arg2: input socket name (0 = ANY_PORT)
#    arg3: requestor type (23 = TYPE_SA)
#
sleep 2
/export/home/csci/bull/bin/csci $curpid 0 23a
```

Glossary

absent cartridge—A volume that is in the database, but that couldn't be found when all recorded locations for the volume were catalogued. If a nonzero retention period is set, the volume status is changed to STATUS_VOLUME_ABSENT.

ACS—*See* Automated Cartridge System**.**

ACSEL—*See* ACS Event Logger.

ACS Event Logger (ACSEL)—The software component that receives messages from other ACSLS components and writes them to an Event Log.

ACS ID—A unique identifier for an ACS.

ACSLH—*See* ACS Library Handler.

ACS library—A library is composed of one or more ACSs, attached tape drives, and cartridges residing in the ACSs.

ACS Library Handler (ACSLH)—The part of the ACSLM that communicates directly with the LMU.

ACSLM—*See* ACS Library Manager.

ACS Library Manager (ACSLM)—The software component that validates and routes library requests and responses.

ACSLS—*See* ACS Library Software.

ACSLS database—ACSLS database containing information about the location and status of the tape cartridges. The information includes cell location, scratch status, etc.)

ACSLS platform—The server hardware and software that provide the proper environment for ACSLS.

ACS Library Software (ACSLS)— Manages ACS library contents and controls ACS library hardware to mount and dismount cartridges on ACS cartridge drives.

ACSLS database—A database used by ACSLS to track the library configuration and the locations and IDs of all tape cartridges in the library.

ACSSA— *See* ACS System Administrator.

ACS System Administrator (ACSSA)—The interface between the Command Processor and the rest of the system.

ADI—Application Data Interchange.

audit—A physical inventory of the contents of all or part of a library.

Automated Cartridge System (ACS)—The library subsystem consisting of a single or dual LMU, and 1 to 24 LSMs connected to that LMU.

automated library—*See* library.

beginning of tape (BOT)—The location on a tape where written data begins.

BOT— *See* Beginning of Tape.

CAP—*See* Cartridge Access Port.

CAP ID—A unique identifier for the location of a CAP. A CAP ID consists of the ACS ID, the LSM number, and the CAP number.

cartridge—A plastic housing containing a length of data recording tape. The tape is threaded automatically when loaded in a transport. A plastic leader block is attached to the tape for automatic threading. The spine of the cartridge can contain an OCR/Bar Code label listing the volume ID.

Cartridge Access Port (CAP)—A bidirectional port built into the door panel of an LSM, which provides for the manual entry or automatic ejection of tape cartridges.

cartridge drive (CD)—A device containing two or four cartridge transports and their associated power and pneumatic supplies.

cartridge tape I/O driver—Operating system software which issues commands (e.g., read, write, and rewind) to cartridge subsystems.

cartridge transport—An electromechanical device that moves tape from a cartridge over a head that writes and reads data from the tape. A transport is distinct from the power and pneumatic sources that supply the electricity and air it needs to function. *See* cartridge drive.

CCI—*See* client computing system.

CD—*See* cartridge drive.

cell—A receptacle in the LSM in which a cartridge is stored.

channel—A device that connects the host and main storage with the input and output control units.

client applications—Software applications that manage tape cartridge contents. They access tape cartridges by interacting with ACSLS. Any number of client applications can be resident on a client system.

client computing system—A computer and an executable image of the operating system.

client software— This software manages tape cartridge contents, generates requests for cartridges, and transfers data to and from cartridges. The client software is *not* part of ACSLS.

Client System Component—Software which provides an interface between the client computing system's operating system and ACSLS.

Client System Interface (CSI)— The software component that translates and routes messages between the ACS Library Manager and the Client System Component.

command access control—Limits access to commands.

command area—The bottom area of the cmd_proc interface where you enter requests and receive responses.

command processor (cmd_proc)— The screen interface of the ACSSA. cmd_proc lets you enter the commands described in Chapter 7.

control path adapter—A hardware device which converts a Client Computing System's control protocol to the control protocol of the StorageTek Library Control System.

control unit (CU)—A microprocessor-based unit logically situated between a channel and up to sixteen cartridge transports. The CU translates channel commands into transport commands and sends transport status to the channel.

CSE—Customer Services Engineer.

CSC—Client System Component.

CSI—*See* Client System Interface.

CSI variables—Used to define various options to fine–tune communications between a CSC and the CSI. You change these variables in the acsss_config program.

CU—*See* control unit.

cycle error messages—Messages that indicate a library or ACSLS failure.

database—A collection of interrelated data records. *See also* ACSLS Database.

data path—The network path that allows client applications read/write access to tape cartridges.

data path adapter—A hardware device which translates a Client Computing System's data protocol to the data protocol of the StorageTek Control Unit.

display area—The top area of the cmd_proc interface that collects messages regarding the status of the library.

ejected cartridge—A volume that has been ejected from the library. If a nonzero retention period is set, the volume status is changed to STATUS_VOLUME_EJECTED.

end of tape (EOT)— The location on a tape where written data ends.

EOT— *See* end of tape.

EPO—Emergency Power Off.

EPROM—*See* erasable programmable read only memory.

erasable programmable read-only memory (EPROM)—A special memory chip that can be erased and reprogrammed.

Event Log—A file, maintained by the ACSEL, that contains messages describing library and ACSLS events.

Event Logger—*See* ACS Event Logger.

external label identifiers— A six–character alphanumeric label on the outside edge of a cartridge used to identify a physical tape volume. It may consist of uppercase letters A through Z, numerals 0 through 9, \$, #, and blanks.

full installation—A complete software installation required for new customer sites or for existing sites where a new library has been installed.

home location—The cell associated with a given cartridge.

ID—Identifier or identification.

Informix—The relational database used by ACSLS 6.1.

Informix Storage Manager (ISM)—The Informix database manager, which manages database backups and offloaded transaction logs.

Initial Program Load (IPL)—A process that activates a machine reset, initiates wake up diagnostics (from EPROMs) and loads functional code.

inline diagnostics— Routines that test components of a subsystem while operating on a time-sharing basis with the functional microcode in the subsystem component.

in–transit cartridges—Cartridges between their source and destination locations. Cartridges are considered in–transit if they are in pass–thru ports, robot hands, or playground.

I/O—Input/Output.

IPC—Interprocess Communication.

IPL—*See* Initial Program Load.

ISM—*See* Informix Storage Manager.

journal—A sequential log of changes made to the database since the last checkpoint.

LAD— Lock Access Door.

LAN—*See* local area network.

large CAP (LCAP)—A 40–cartridge CAP with the storage cells arranged in four removable magazines of ten cells each. The magazines appear as a single column of 40 cells to the host software.

LCAP—*See* large CAP.

LCU—*See* Library Control Unit.

LED—*See* Light Emitting Diode.

library—A library is composed of one or more ACSs, attached tape drives, volumes in the ACSs, and the ACSLS software that controls and manages the ACSs.

library configuration options—Allows the customer to specify the number of ACSs in the library and the connections between each ACS and the server system.

library control component—Software which controls the mounting and dismounting of cartridges in the ACS.

library control processor—Properly configured computer hardware that, with the addition of appropriate software, supports the operation of the Library Control Software.

library control system—The library control platform loaded with library control software (ACSLS).

library control software—The software components of ACSLS including the library control component, the Client System Interface and Library Utilities.

Library Control Unit—The portion of the LSM that controls the picking, mounting, dismounting, and replacing of tape cartridges.

library drive—A cartridge transport attached to an LSM that is connected to, and controlled by, a client system. Library drives interact with the LCU during automated tape cartridge mount and dismount operations. Library drives interact with a client application during tape data transfer operations. Library drives are individually addressable by the ACSLM and are individually accessible by client applications. *See* Cartridge Transport.

library errors—Errors that occur because the library is offline, has suffered hardware failure, is unavailable, etc.

Library Management Unit (LMU)—The portion of an ACS that manages LSM's, allocates their resources, and communicates with ACSLS.

Library Storage Module (LSM)—An ACS structure that provides the storage area for cartridges, cartridge drives, CAPs, and the robot necessary for moving them.

light emitting diode (LED)—A light emitting device that uses little energy and is used mainly to indicate on/off conditions.

LMU—*See* Library Management Unit.

local area network (LAN)—A computer network in which any component in the network can access any other component. This is the type of interface between an LMU and attached LSM's.

LSM—*See* Library Storage Module.

LSM ID—A unique identifier for an LSM. The LSM ID consists of the ACS ID and the LSM number.

missing cartridge—A volume that is in the database, but couldn't be found. If a recorded possible location for the volume could not be examined due to an offline LSM or a drive not communicating, the volume is marked MISSING instead of ABSENT. The volume status is changed to STATUS_VOLUME_MISSING.

network adapter—Equipment that provides an electrical and logical interface between a network and specific attached equipment.

Network Interface (NI)—An interface between the server system and the client systems that maintains network connections and controls the exchange of messages. The NI is resident on the server system and each client system.

NI—*See* Network Interface.

OCR—Optical character recognition.

ONC—Open network computing.

Open Systems Interconnection (OSI)—A software architecture model of the International Organization for Standardization. The OSI model provides standards for the interconnection of data processing systems.

OSI— *See* Open Systems Interconnection.

OSLAN—Open Systems Local Area Network.

Pass–Thru Port (PTP)—Mechanism that allows a cartridge to be passed from one LSM to another in a multiple LSM ACS.

PCAP—*See* priority CAP.

playground—A reserved area of special cells (within an LSM) used for storing diagnostic cartridges and cartridges found in–transit upon power–on and before initialization of the LSM is completed.

pool—A collection of tape cartridges having one or more similar features or attributes, such as a pool of scratch tapes.

POST—Power–on self–test.

priority CAP (PCAP)—A single–cartridge CAP used for priority entry and ejection of cartridges.

processing errors—Errors that result from processing or network communication failures.

PROM—Programmable read-only memory.

PTP—*See* Pass–Thru Port.

RDBMS—Relational database management system.

redo log files—Backup files used to restore the ACSLS database.

relational database—A database that is organized and accessed according to relationships between the data items; relationships are represented by tables.

ROM—Read–only memory.

RPC—Remote Procedure Call.

SCAP—*See* standard CAP.

scratch—An attribute of a tape cartridge, indicating that it is blank or contains no useful data.

SCSI—Small computer serial interface.

second disk journaling—Allows for the database's journal records to be written to a second disk device, instead of writing records to the primary disk. This improves the chances of recovery from a disk failure.

server system—The part of the library that is the residence for ACSLS, now referred to as the Library Control System. The Library Control System acts as an interface between a library and client systems.

server system user—A person who invokes ACSLS commands, utilities, or procedures on the server system. Server system users are generally site and maintenance personnel (for example, library operators, tape librarians, system administrators, CSEs, and systems personnel).

servo—A system that uses feedback to control a process.

silo—A commonly used term for an LSM. *See* Library Storage Module.

SIMM—Single inline memory module.

SQL—*See* structured query language.

SRN. *See* service request number.

SSI—*See* Storage Server Interface.

SSR—Software Support Representative.

Standard CAP (SCAP)—A 21–cartridge CAP with the storage cells arranged in three rows of seven fixed cells.

Storage Server Interface (SSI)—A software component, resident on a client system, that translates and routes messages between client applications and the CSI.

structured query language (SQL)—A language used to define, access, and update data in a database.

system resource variable—Used to control the amount of system resources used by ACSLS.

system unit—The Library Control Platform.

tape library management system (TLMS)— A type of client application.

TCP—Transmission Control Protocol.

TLMS—*See* tape library management system.

TOD—Time of day.

UDP—User Datagram Protocol.

UNIX—An operating system originally developed by Bell Laboratories (now UNIX Systems Laboratories, Inc.) and used by a variety of computer systems.

unsolicited messages—Messages that indicate an error or notify you when a particular routine action can be taken.

UOC—Usable on codes.

upgrade installation—Performed when installing a new version of ACSLS at an existing customer site.

user–selectable features and options variables—Used to define various user–selectable features and options.

validation errors—Errors that result from format and syntax validation performed by cmd_proc.

venter—Virtual enter. Entering an unlabeled cartridge with a virtual label.

virtual label—A logical volume ID (volser) that can be assigned to a cartridge when its physical label is missing or unreadable.

volser—Volume Serial Number.

volume—A tape cartridge.

volume access control—Limits access to volumes, usually by the client.

volume identifier—A six-character string that uniquely identifies a tape cartridge to the database.

volume serial number (volser)—A synonym for external label identifier.

WTM—write tape mark.

XDR— External data representation.

XML—Extensible Markup Language. A universal format for structured documents and/or data on the Web.

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